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A PROJECTION OF MANPOWER REQUIREMENTS BY OCCUPATION IN 1975

Canada and its Regions

by
B. Ahamad

Research Branch
Program Development Service
DEPARTMENT OF MANPOWER AND IMMIGRATION
CANADA

1969

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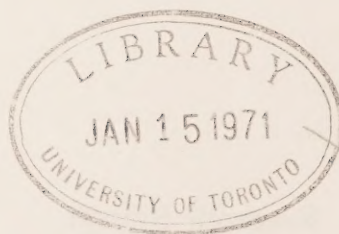
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FOREWORD

This study is an exploration of how the growth of the Canadian economy is capable of affecting the structure of the future requirements for manpower. It contains projections for 1975 of the requirements for manpower by occupation group and by region. The study is one of a series of projections studies of Canada's future manpower requirements and supplies which are being made in the research programme of the Department of Manpower and Immigration. The programme is designed to develop projections which will contribute towards consistent and related planning and policy-making for investment in education and training, employment, career counselling, immigration and other manpower policies; and also for the development of these manpower and education policies in relation to other social and economic policies.

The first study of this kind published by the Department was 'Canada's Manpower Requirements in 1970' by N.M. Meltz and G.P. Penz which was an assessment of the implications for manpower of the projections of total employment and output made by the Economic Council of Canada. It was followed by 'Manpower in Canada, 1931 to 1961: Historical Statistics of the Canadian Labour Force' by N.M. Meltz which presented for reference the standardized statistics which had been used in making the projections of requirements to 1970. The study now being issued contains much more detailed projections to 1975 of Canada's future manpower requirements. It will be followed by a study which will present standardized data by region for 1951 and 1961 which has been used in developing the projections. The programme is being developed to take more full account of inter-relationships within the economy and in the processes of production which generate the requirement for manpower, to make detailed studies of particular sectors and studies of requirements for and supplies of manpower in the more highly qualified and skilled occupations.

The study was carried out in the research programme of the Department of Manpower and Immigration under the direction of K.V. Pankhurst by B. Ahamad. He was assisted by H.S. Tjan in the development of the early design of the study, by D. Dyck and P.S. Johal who prepared the estimates of attrition, and by J. Dean, J. LeBlanc, J.A. Lennie, B. McNeely, J. Skelton and L. Warrack, on loan from the Manpower Information and Analysis Branch who assisted in the modification of the first projections.

Grateful acknowledgement is made to the many economists and others in government, industry and in the universities who commented on the study while it was in progress. Special acknowledgement is due to Mrs. A. Kempster of the Dominion Bureau of Statistics whose assistance in preparing the data for use in this study was invaluable.

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Research Branch.

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Assistant Deputy Minister,
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CHAPTER 1

SUMMARY

This report describes the methods and the results of one of the studies in the manpower research program in the Department of Manpower and Immigration. The purpose of the study was to make projections of manpower requirements by occupation for Canada and for each of the five economic regions, for 1975, as an aid to the efficient planning of manpower policies and programs, for example career counselling, the occupational re-training of adults, mobility and immigration. The projections have been made as detailed as possible to provide a comprehensive framework within which other projections may be made.

The report is divided into two sections. Section I (Chapter 1) is a summary of the method and results; section II (Chapters 2-7) includes a more detailed discussion of the usefulness and limitations of the methodology (Chapter 2), a brief outline of manpower and economic growth in Canada and its regions (Chapter 3), a description of the actual making of the requirements projections (Chapter 4), an analysis of their sensitivity (Chapter 5), the estimates of required inflow (Chapter 6), and a discussion of the results and their uses in manpower planning (Chapter 7).

At the outset, it should be noted that the projections are based on a number of assumptions, which are often not explicitly stated, and that it is possible to derive reasonable alternative projections simply by changing some of these assumptions. In addition, the basic data used in making the projections are subject to unknown errors, some of which may be quite large. Because of this, the projections will probably need to be revised from time to time as better data become available.

For these reasons, the numbers of people projected in the various occupations are not exact in any sense and they should only be used as rough indicators of the occupational requirements. This point cannot be over-emphasized and we strongly advise that the entire report be read

in order that the nature and limitations of the projections may be fully appreciated. This is particularly important if the results are to be used for planning purposes and practical decision-making.

I. Method

The method adopted in this study was chosen after some consideration of available data. Projections of manpower requirements by occupation may be obtained by incorporating a manpower component into an input-output model of the economy: separate projections are made for the occupational input per unit of output in each industry, and these provide occupational projections when multiplied together, and summed over all industries. An input-output model could not be used in the present study partly because the 1961 input-output table being prepared by the Dominion Bureau of Statistics was not available at the start of the study. In addition, the construction of an input-output model is time consuming and it will probably be several years before a model can be built and made operational: it was felt that some projections should be made as soon as possible, and preferably by late 1969.

In the present study, we used a three-step procedure for making projections of occupational requirements: for each of the twelve major industries, we projected (a) occupational employment as a proportion of total employment, (b) total employment per unit of output and (c) the level of output. Occupational projections were then obtained by multiplying the three projections together and summing over all industries.

II. Occupational Distributions

Detailed occupation by industry statistics are available only in census years but they are not directly comparable from one year to the next because of changes in both the occupational and industrial classifications used. Our first task was therefore to convert existing census data to a common classification basis: the data were converted to the 1961 census occupational classification and the 1960 Standard Industrial Classification. The conversion procedure is extremely time consuming, so we limited it to the twelve major industry divisions of the Standard Industrial Classification for Canada as a whole, and to the censuses of 1941 and 1951.

The conversion procedure is simply a process of re-classification of existing census data: hence conceptual differences between the censuses are not removed in conversion. For example, the censuses of 1951 and 1961 were based on the labour force concept whereas the census of 1941 was based on the gainfully occupied concept. The chief difference between the two is that an individual's occupation is chosen with reference to his job in a specified period in the former but with reference to his usual job in the latter. The occupational statistics will thus tend to differ under both concepts, especially so for seasonal and female workers.

For Canada, projections of the occupational distribution of each industry, (that is, the ratio of employment in a given occupation and industry to total employment in that industry) were obtained by simple extrapolation of the trend through the three census points. For convenience the distributions were first transformed to index form (1966 = 100) and then plotted on a logarithmic scale. Some of the graphs show a remarkably linear trend through the three points and it was fairly easy to derive projections in these cases. However in some cases, the graphs show wide variations and making a projection was almost reduced to mere guesswork.

The same methods could not be used for making regional projections since we had only one observation (1961) for the occupation-industry matrix of each region. These projections were obtained using the national projections: thus we applied the projected changes in the national occupational distributions for each industry for the period 1961-75 to the 1961 regional occupational distributions for each industry. This procedure was not entirely mechanical, as we often had to make adjustments on the basis of judgement. This was particularly true for the primary industries.

III. Employment and Output

Estimates of employment by industry are currently available from two main sources, the Labour Force Survey and the Employment Survey. The Labour Force Survey is a household survey based on roughly 1% of the total population. The Employment Survey is an establishment survey and is therefore more suitable for industry analysis: it covers all establishments with 15 or more employees and about 10% of known establishments with less than 15 employees. The two surveys differ in coverage and concept, for example, in the treatment of employees absent without

pay, and consequently the estimates often differ considerably.

In this study the estimates of total employment by industry were based on estimates from the Employment Survey, while the Labour Force Survey was used to fill in the gaps by providing estimates of other than paid workers in all industries and of total employment in agriculture, fishing and trapping, and public administration.

The above estimates were available on the basis of the 1960 Standard Industrial Classification only for the period since 1961. This gave us only seven annual observations which we felt were too few for making projections to 1975. However, comparison of estimates under both the 1960 Standard Industrial Classification and the 1948 Standard Industrial Classification for the period 1961-64 showed similar trends for roughly comparable major industries. We therefore obtained estimates by industry for the period 1953-60 by applying the trend in the corresponding industry in the 1948 Standard Industrial Classification.

Estimates of output measured in terms of Gross Domestic Product are available by industry (on the basis of the 1960 Standard Industrial Classification) for Canada, but not for the regions. In making regional projections, we therefore collapsed steps (b) and (c) in our projections method into one step and projected employment directly. The same was done for some industries at the national level: for public administration because of the implicit assumption of unit productivity in estimating output, and for agriculture and fishing and trapping because of large fluctuations in output due to the effects of weather and other vagaries of nature.

Initial projections were obtained by graphically fitting the 'best' straight line through the logarithms of the time series observations. We did, however, tend to give more weight to the observations for 1956 and 1966 since in those years the economy operated close to its existing potential. In this way we tried to adjust our projections to the potential growth path of the economy to 1975.

The initial projections for Canada were circulated to a number of knowledgeable and interested persons in universities, industry, and federal and provincial government departments. Most of these people took the time to comment on the projections which were then modified to take account of the opinions expressed. At the regional level, we interviewed several people who we felt could provide more varied insight and knowledge about future economic developments.

Our discussions here generally confirmed our views about the uncertainty of the effects of changing demand conditions and government policy on employment by industry. We therefore decided to prepare two projections of employment by industry and region to reflect some of this uncertainty about the future and also to show how the projections can vary when the assumptions are changed. In general, the difference between the alternatives is greater for the primary industries.

The sum of the modified regional projections was then compared with our modified national projection for each industry. The differences were generally small; but in some cases, notably agriculture, the large difference prompted us to undertake further discussion in the regions.

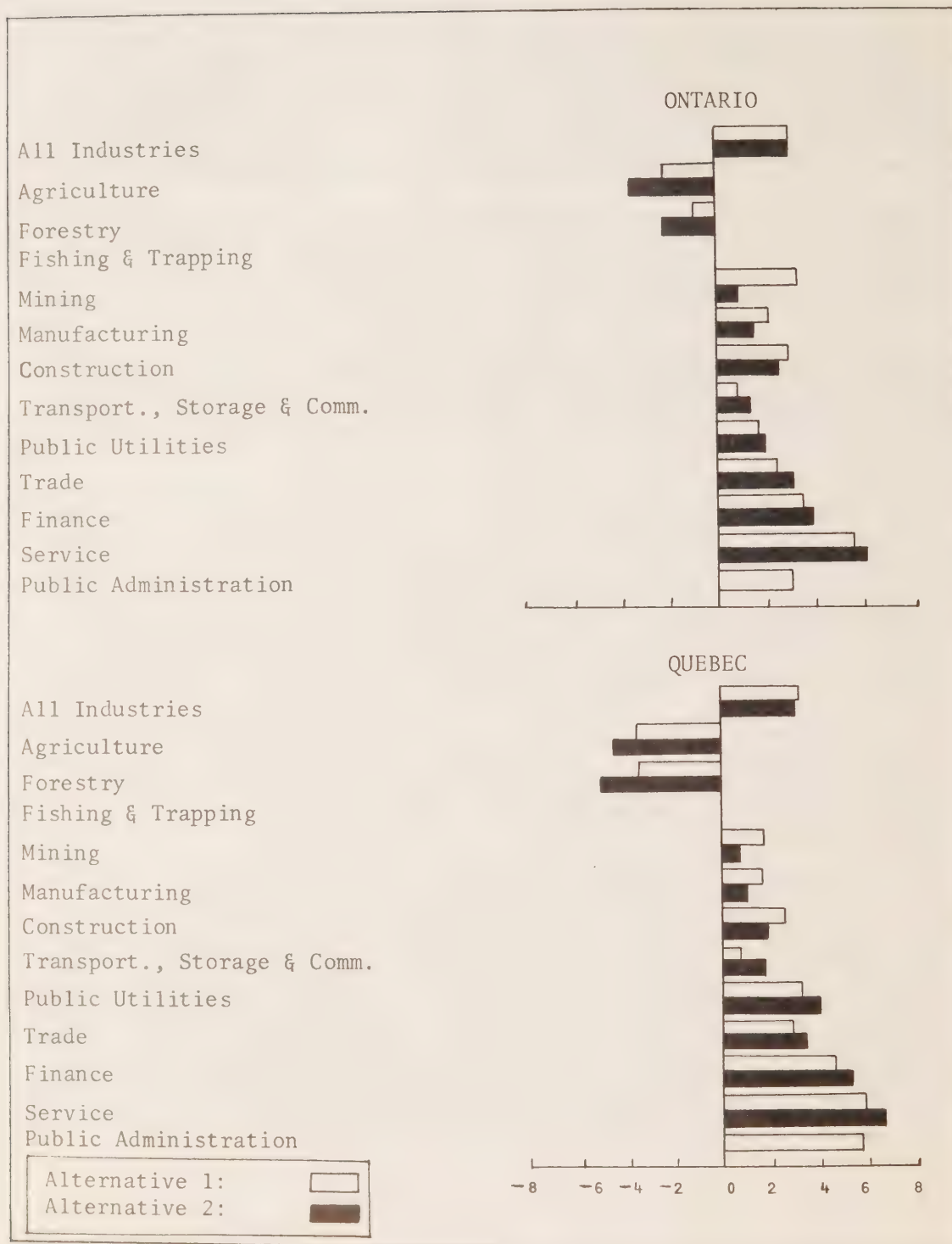
Our final employment projections by industry have therefore been arrived at after much careful scrutiny and adjustment of the national and regional projections. They are thus based on a great deal of subjective assessment and are obviously limited by the uncertainty in our judgement.

The projected annual average rates of growth of employment for the period 1966-75, for each industry and region are compared graphically in Figure 1.1. Generally these show a decline in employment in the primary industries over all regions, though employment in mining and, in some regions, forestry, show increases because of the expected effects of new developments and discoveries. In the secondary and tertiary industries employment is projected to increase in all regions.

The unshaded and shaded areas in the diagrams represent the projected rates of growth under the two alternative projections. Once again these show the relatively greater variability in employment prospects in the primary industries and, in particular in the Atlantic and Prairie regions.

Our employment projections are shown in slightly different form in Table 1.1: here we include the projected percentage share of total employment in each industry for each region. There are some striking similarities across regions: for example, the projected share of employment in service-producing industries shows very little variation across the regions. On the other hand, the shares in both manufacturing and the primary industries vary substantially between regions. In 1975, agricultural employment is projected to be still relatively important in the Prairie region, while manufacturing is projected to be relatively less important than in the other regions.

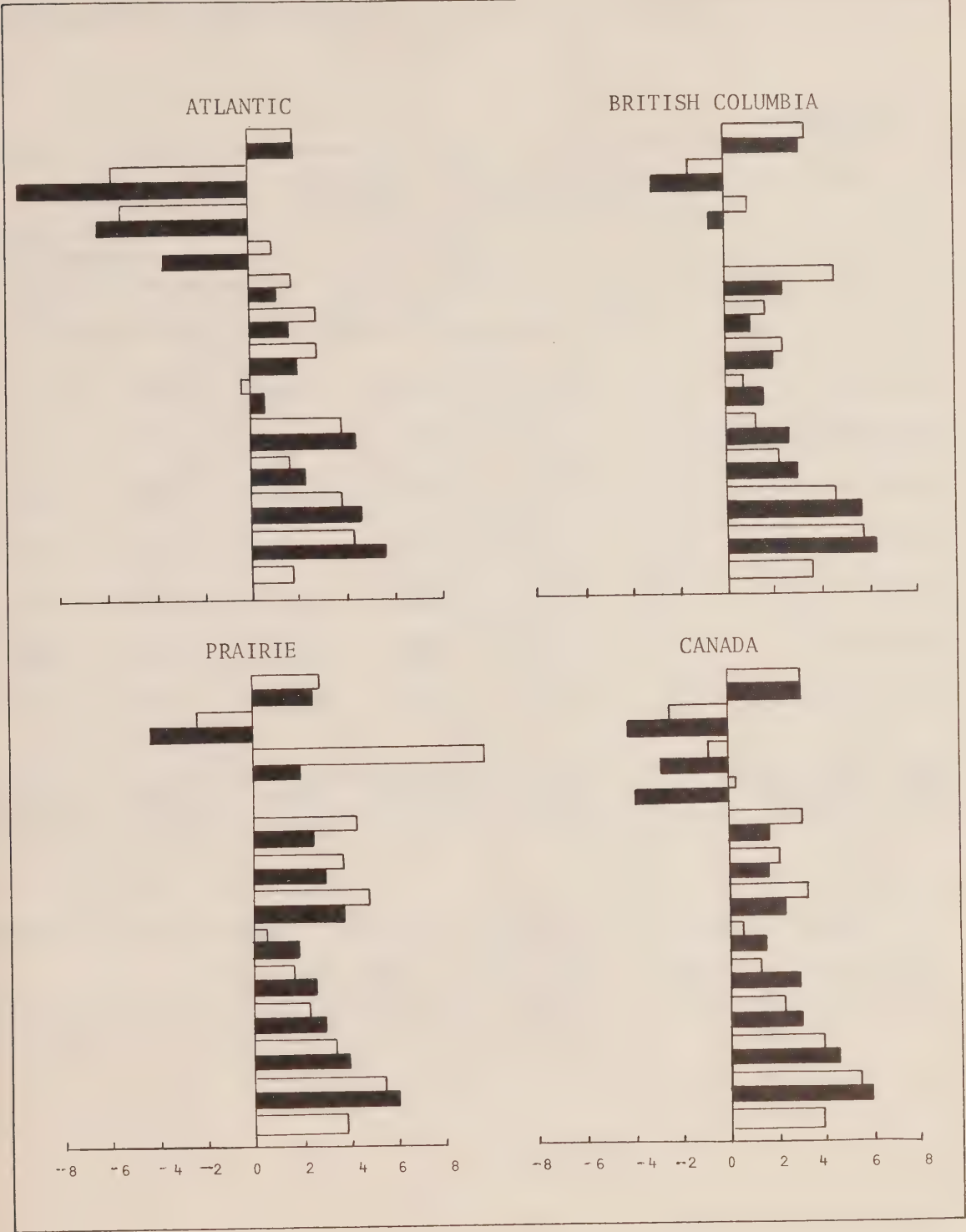
PROJECTED ANNUAL AVERAGE RATES OF GROWTH



Note: For Public Administration, only one projection of employment is made.

OF EMPLOYMENT BY INDUSTRY DIVISION BY REGION

Percentage Rates of Growth



PROJECTED SHARE OF EMPLOYMENT BY

	ATLANTIC		QUEBEC	
	Alternative			
	1	2	1	2
Agriculture	3.1	2.2	3.2	2.8
Other Primary (a)	7.7	6.2	2.0	1.8
Manufacturing	15.8	14.4	23.7	22.3
Other Secondary (b)	9.5	8.8	6.8	6.3
Trade	15.7	17.0	14.9	15.5
Service	27.7	30.2	30.5	31.6
Other Service (c)	20.6	21.3	18.8	19.6
All Industries	100.0	100.0	100.0	100.0

- (a) Other Primary: Forestry, Fishing and Trapping, Mining, Quarrying, Oil Wells.
- (b) Other Secondary: Construction, Public Utilities.
- (c) Other Service: Transportation, Communication, Storage, Finance, Insurance, Real Estate, Public Administration.

Percentages

[illegible]

IV. Sensitivity Analysis

The two projections of the industrial structure of regional employment were obtained from the alternative employment projections for each industry by combining the lower projections for the goods-producing industries with the higher projections for the service-producing industries, and visa-versa. Obviously these represent only two of the very many possible combinations⁽¹⁾ and hence only two of the possible projections of the regional industrial structure. Similarly, our projections of the occupational distribution of each industry give only one possibility; but although we could also have made reasonable alternative projections here, the work involved would have been enormous.

The two projections of occupational requirements derived using the projections of the occupational distribution and the levels of employment in each industry thus provide only a rough indication of the range of manpower requirements in 1975. It is clearly important for planning purposes that we know how sensitive the projections of occupational requirements are to alternative assumptions about the occupational distribution and the level of employment in each industry.

If the final projections are fairly insensitive to alternative assumptions, that is if very large changes in either the occupational distribution or employment in each industry generate very small changes in the final projections, then the two projections will provide a fairly good indication of the range of reasonable alternative projections of occupational requirements. On the other hand, if the final projections are highly sensitive to alternative assumptions, this indicates that further investigation is required either to provide a wider range of projections or to develop a more appropriate model for making these projections.

Our sensitivity analysis suggests that the projections for the occupations which are concerned in one industry and which form only a small proportion of employment in that industry will be extremely sensitive in the sense that alternative assumptions will generate large changes in the projections. For occupations which are not industry-

(1) *The maximum possible number of combinations is 2^{11} , or 2,048.*

specific, the projections are less sensitive to alternative assumptions about the growth of any particular sector. Similarly, if the ratio of employment in a particular occupation and industry to total employment in that industry is large, then the relative range of reasonable alternative assumptions about changes in the ratio is small; thus the range of the projections for these occupations will be fairly insensitive to alternative projections of the occupational distribution.

Using these criteria, we have attempted to draw up a scale showing the sensitivity of the range of the projections of occupational requirements given in Appendix Table I.1. The scale ranges from A to E: the projections which appear to provide a fairly insensitive range of alternatives are indicated with an A, and the sensitivity gets progressively greater as we move down the scale to E.

The scale has been derived using the occupation-industry matrix for Canada only since it would have been too much work to repeat the scaling procedure for all regions. It is clear that for some occupations the regional projections will be no more sensitive than the national projections. However because of the greater possibility of variation at the regional level, we feel that the arbitrary procedure of assigning the next lower letter on the national scale to the corresponding regional projections may give a fairly safe approximation: in this case the occupations with a D or E at the national level would be considered highly sensitive at the regional level. In addition, occupations with less than about a thousand people should, because of the small number, also be placed in the same category.

The scale suggests that the projections for all of the occupation divisions, many of the occupation major groups, and some of the occupation classes provide a fairly good indication of the range of occupational requirements. For Canada, 25% of the projections can be considered to be fairly insensitive, while 35% can be considered to be very sensitive. For the regions, however, more than 50% can be considered to be very sensitive.

V. Occupational Requirements

The projections of manpower requirements are given for all occupations in Appendix Table I.1; the projections for the occupation divisions⁽¹⁾ are represented graphically in two different ways in Figures 1.2 and 1.3. In Figure 1.2 we show the percentage share that employment

⁽¹⁾ *These projections are also given in Table 1.2.*

PROJECTED MANPOWER REQUIREMENTS BY

	ATLANTIC		QUEBEC	
	Alternative			
	1	2	1	2
Managerial	49.4	51.1	205.8	209.8
Professional and Technical	89.0	95.2	404.0	416.4
Clerical	73.0	75.9	369.3	378.6
Sales	39.1	41.5	158.6	163.6
Service and Recreation	84.0	90.0	348.7	361.7
Transportation and Communication	46.0	46.9	161.7	167.7
Farming	21.4	16.4	84.6	77.7
Logging	8.8	8.0	14.1	12.6
Fishing	18.2	12.3	0.8	0.7
Mining	10.3	9.5	11.3	10.4
Craftsmen	151.0	146.6	634.3	618.8
Labourers	32.1	31.8	91.2	90.9
All Occupations	622.2	625.3	2,484.4	2,509.1

Source: Appendix Table I.1

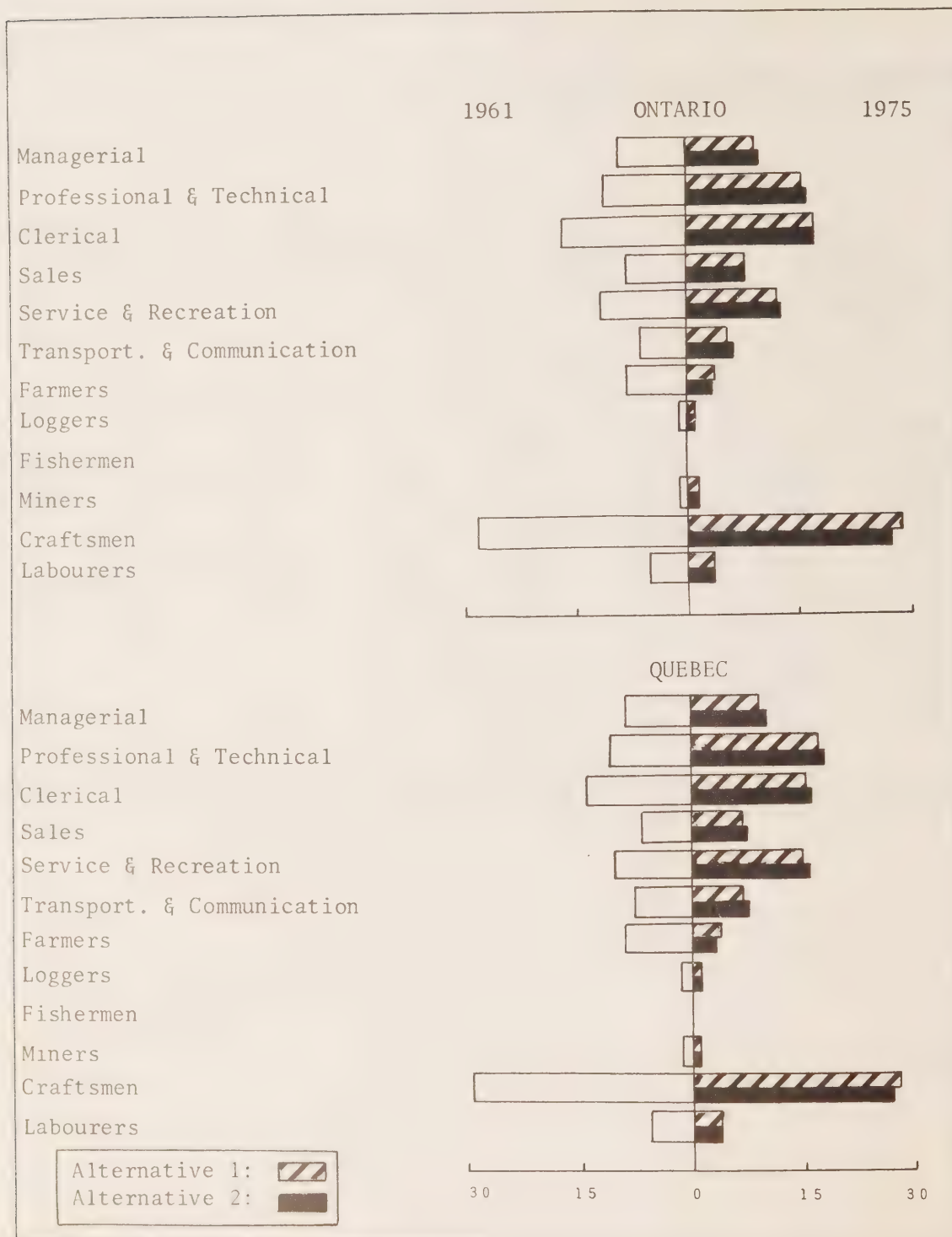
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OCCUPATION DIVISION BY REGIONS, 1975

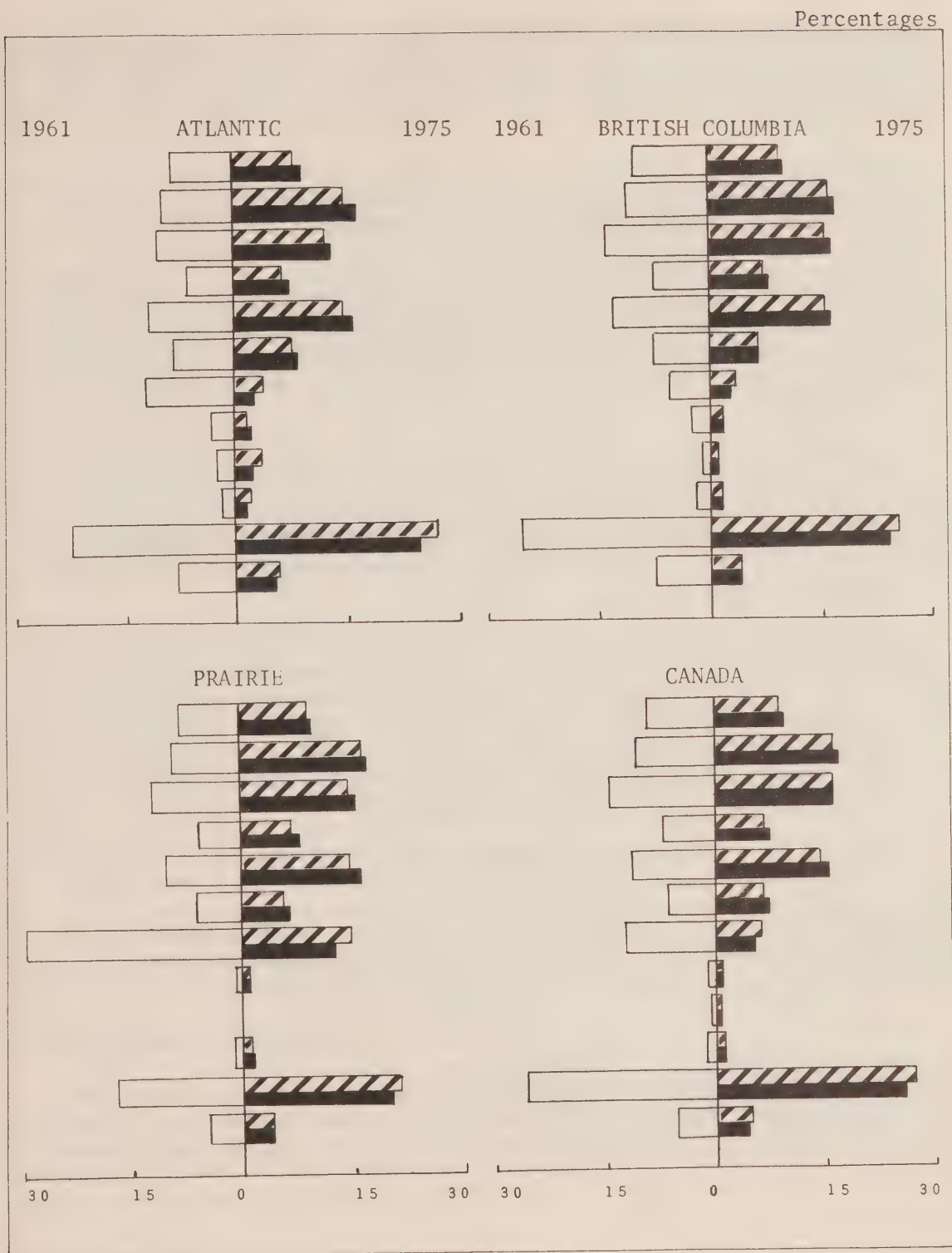
Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Projections							
1	2	1	2	1	2	1	2
306.3	305.6	122.2	123.7	79.8	82.2	763.7	772.6
516.5	521.6	223.2	237.1	132.4	136.0	1,366.8	1,397.5
575.8	578.2	202.0	207.1	123.4	128.6	1,340.6	1,366.0
237.0	238.5	92.3	95.6	57.7	61.1	585.6	601.2
460.8	470.5	204.4	210.3	125.6	130.2	1,222.1	1,261.4
194.6	196.9	80.4	82.9	52.4	53.8	533.3	546.2
126.4	114.7	199.4	171.0	25.7	23.6	457.7	403.8
7.5	6.8	6.8	4.2	11.9	10.6	50.8	43.9
0.8	0.7	2.0	1.5	3.2	2.8	24.6	17.9
21.1	17.8	12.6	11.2	6.1	5.3	59.4	52.5
919.0	887.5	288.7	279.3	200.5	195.9	2,198.9	2,133.4
118.0	116.3	51.8	50.3	31.4	30.9	322.5	318.5
3,483.7	3,454.9	1,485.8	1,464.2	850.0	861.0	8,926.0	8,914.4

DISTRIBUTION OF MANPOWER REQUIREMENTS BY



OCCUPATION DIVISION BY REGION, 1961 AND 1975



in each occupation division formed of employment in 1961 and is projected to form of employment in 1975. The differences generated by the alternative employment projections for 1975 are fairly small, except in the primary occupations.

In all regions, according to each of the two alternative projections managerial occupations are projected to maintain their 1961 share at roughly 8% or 9%, while professional and technical occupations are projected to increase in importance from about 10% to 15%. Clerical occupations and service and recreation occupations are also projected to increase in relative importance while sales occupations and transportation and communication occupations are projected to roughly maintain their 1961 shares; the same is generally true for craftsmen and production process workers, except in the case of the Prairies and Atlantic regions.

The primary occupations are all projected to decline in relative importance. Here the greatest decline is in the case of farmers and farm workers; this is particularly true in the Prairie region, where the share is projected to fall from about 28% in 1961 to somewhere between 11% and 14% in 1975. Labourers are also expected to decline in relative importance in all regions.

The graphs show quite clearly that the regional occupational structures are projected to be much more similar in 1975 than they were in 1961. This is to be expected because of the relatively rapid decline in employment in the primary industries and the growing importance of service-producing industries in all regions. Only the Prairie and Atlantic regions are projected to still have a substantial share of employment in 1975 in the primary occupations.

In Figure 1.3, we show the projected changes in the level of employment in each occupation division for the period 1961-75. Once again we note that the largest projected increases are in professional and technical occupations and service and recreation occupations. All other occupations, except the primary occupations and labourers in some regions, also show substantial increases over the period.

It is interesting to compare the relative differences between the alternative projections of employment by industry (Figure 1.1) with the relative differences between the projections of occupational requirements generated by the alternative employment projections (Figure 1.3). In Figure 1.3 the differences are relatively much smaller than

those in Figure 1.1. The notable exceptions include the primary occupations where the relative differences are almost as large as those in the corresponding primary industries. The relative differences for service and recreation occupations are also almost as large as those in the service sector.

VI. Required Manpower Inflow 1961-75

The projections of manpower requirements by occupation represent the manpower stock which will be necessary to satisfy our assumptions about the level and structure of final demand and the technological structure of industries in 1975. These requirements may be met by the existing manpower resources in each occupation, or by additions from persons outside the labour force, from immigration, from manpower re-training programs and so on. One of the aims of manpower planning is clearly to ensure that these additional manpower resources are provided in the most desirable or efficient way. To do so we need to assess the potential manpower resources available from all possible sources and then to act on our policy variables to produce the desired effects.

The additional manpower to be provided between the base year and the projection year is the difference between the projected manpower requirements in 1975 and the 1961 manpower stock corrected for mortality and retirement. This manpower gap, which we have called the required manpower inflow, represents the additional manpower resources which must be provided by net additions to the labour force by net immigration, by net domestic migration and by net occupational mobility with or without re-training. It is important to note that the required manpower inflow gives no indication of the ways in which the manpower gap may be filled or indeed of whether or not intervention into the workings of the labour market is in fact necessary.

The required manpower inflow is given in Table 1.2 for the occupation divisions and in Appendix Table II.1 for all occupations. A positive sign indicates an additional number of persons needed in the given occupation while a negative sign indicates a reduction in manpower necessary in the given occupation.

The figures in Table 1.2 show that the required manpower inflow is projected to be largest for craftsmen, production process and related workers. Professional and technical occupations are the next highest, followed by service and recreation occupations and clerical occupations. In all the primary occupations, except miners, quarrymen and related

REQUIRED MANPOWER INFLOW BY

	ATLANTIC		QUEBEC	
	Alternative			
	1	2	1	2
Managerial	16.6	18.3	97.3	101.3
Professional and Technical	48.2	54.4	255.0	267.4
Clerical	28.4	31.3	183.4	192.7
Sales	11.4	13.8	73.5	78.5
Service and Recreation	35.3	41.3	194.7	207.7
Transportation and Communication	15.9	16.8	72.0	78.0
Farmers, etc.	-5.1	-10.1	-19.7	-26.6
Loggers, etc.	-5.2	-6.0	-10.6	-12.1
Fishermen, etc.	2.0	-3.9	-1.3	-1.4
Mines, etc.	2.4	1.6	1.3	0.4
Craftsmen etc.	64.2	59.8	254.1	238.6
Labourers	3.2	2.9	12.4	12.1
All Occupations	217.3	220.4	1,112.0	1,136.7

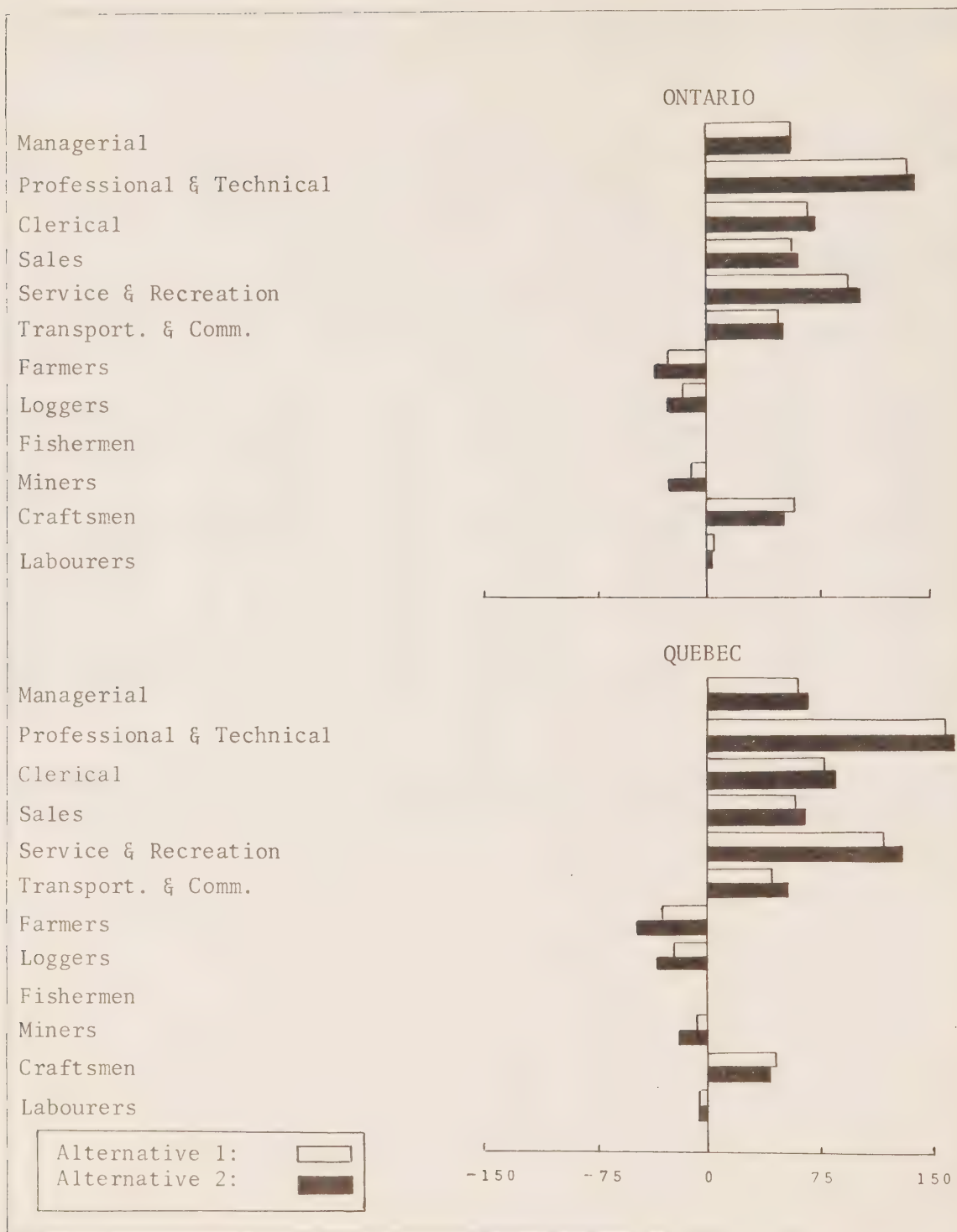
Source: Appendix Table II.1

OCCUPATION DIVISION BY REGION, 1961-75

thousands

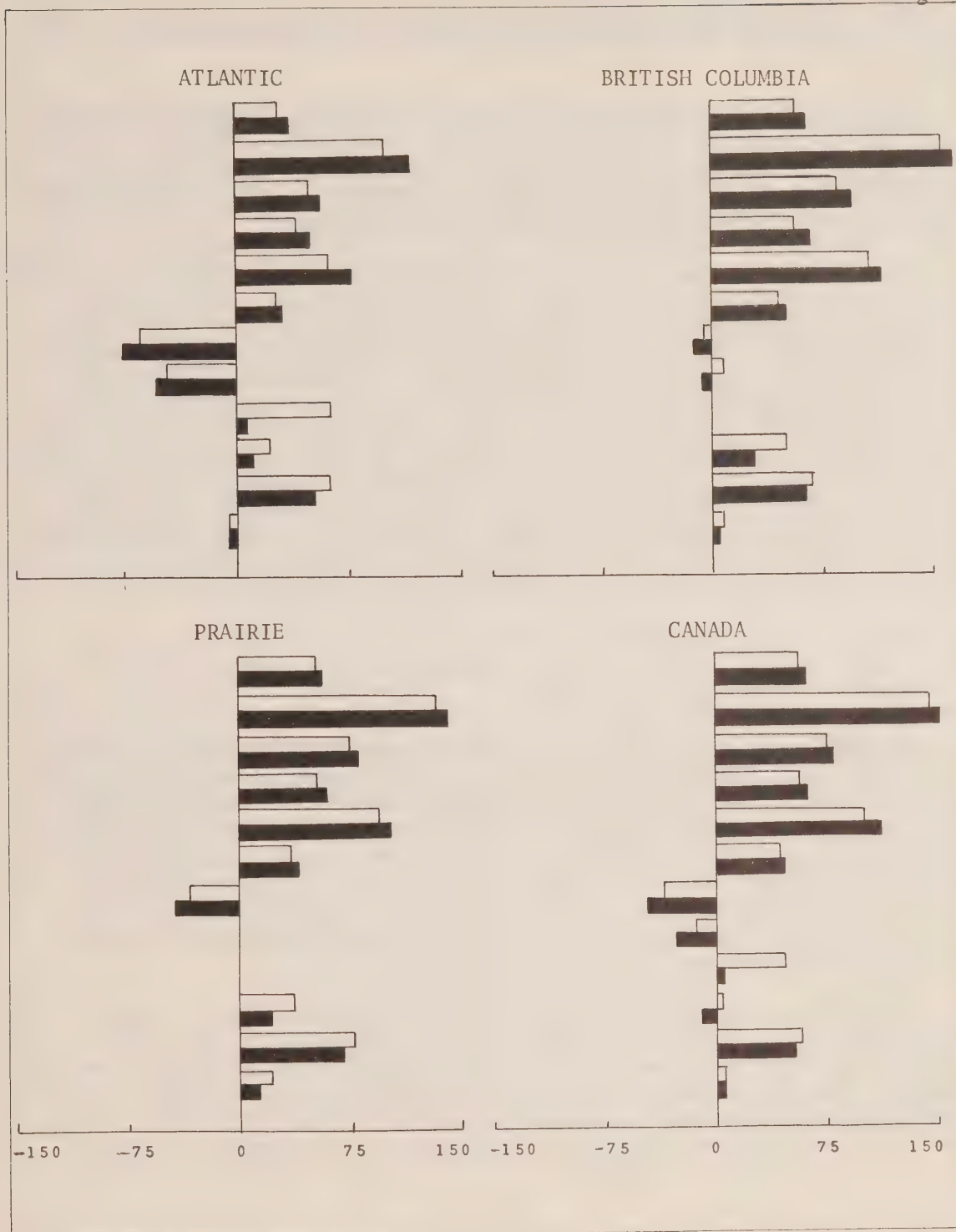
ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Projections							
1	2	1	2	1	2	1	2
149.3	148.6	54.1	55.6	36.6	39.0	354.0	362.9
329.5	334.6	139.6	143.5	87.3	90.9	861.3	892.0
283.8	286.2	96.3	101.4	62.1	67.3	651.0	676.4
112.3	113.8	37.0	40.3	24.3	27.7	259.4	275.0
253.9	263.6	109.2	115.1	71.4	76.0	663.2	702.5
92.1	94.4	32.9	35.4	24.1	25.5	235.2	248.1
-3.3	-15.0	-13.4	-41.8	7.2	5.1	-35.6	-88.5
-1.1	-1.8	3.8	1.2	2.5	1.2	-8.7	-15.6
-0.6	-0.7	-0.3	-0.8	-0.5	-0.9	-1.1	-7.8
2.2	-1.1	5.1	3.7	2.5	1.7	11.6	4.7
458.6	427.1	147.0	137.6	99.2	94.6	1,028.8	963.3
27.0	25.3	14.5	13.0	6.8	6.3	61.9	57.9
1,703.6	1,674.8	625.6	604.0	423.3	434.3	4,081.8	4,070.2

PROJECTED GROWTH IN MANPOWER REQUIREMENTS



BY OCCUPATION DIVISION BY REGION, 1961-75

Percentages



workers, the required manpower inflow is negative indicating a net outflow of manpower; once again this is largest for farmers and farm workers.

Figure 1.4 shows charts of the required manpower inflow as a percentage of the manpower requirements for the occupation divisions. This percentage represents that part of the requirements which has to be met by new entrants to the occupation and hence provides a rough indicator of relative demand for the various occupations.

Once again the diagrams show that there are large differences between the various occupations. Relative demand is expected to be greatest in professional and technical occupations and lowest in the primary occupations. There are also some striking differences between the regions. For example in loggers and related workers, the percentage differs considerably between Ontario and Quebec despite the fact that the requirements in both regions are projected to fall by roughly the same percentage. The difference arises because of the different age structure of loggers in the two regions: in 1961 the average age of male loggers was 33 in Quebec but 38 in Ontario. Thus a larger part of the contraction of loggers will be taken up by mortality and retirement in Ontario than in Quebec, and hence planning for the re-training of loggers becomes relatively more important in the latter.

VII. Conclusion

The projections of occupational requirements obtained in this study are based on a number of simplifying assumptions which may not be completely valid. The method used is rather crude and we have assumed that the occupational structures of the employed labour force depends only on the industrial structure of employment and on the occupational structure of each industry. This assumption may be fairly realistic but further research needs to be undertaken to justify its use. However, it is clearly not completely valid in the present study because of the broad industry groups used.

Our initial projections have, moreover, been made by the simple extrapolation of past trends, but these have been modified to take account of views expressed about the effects of expected future developments. The extrapolation of time trends assumes that all the relevant variables will continue to change as they have done in the past. This may also be a rather unrealistic assumption: for example, it seems

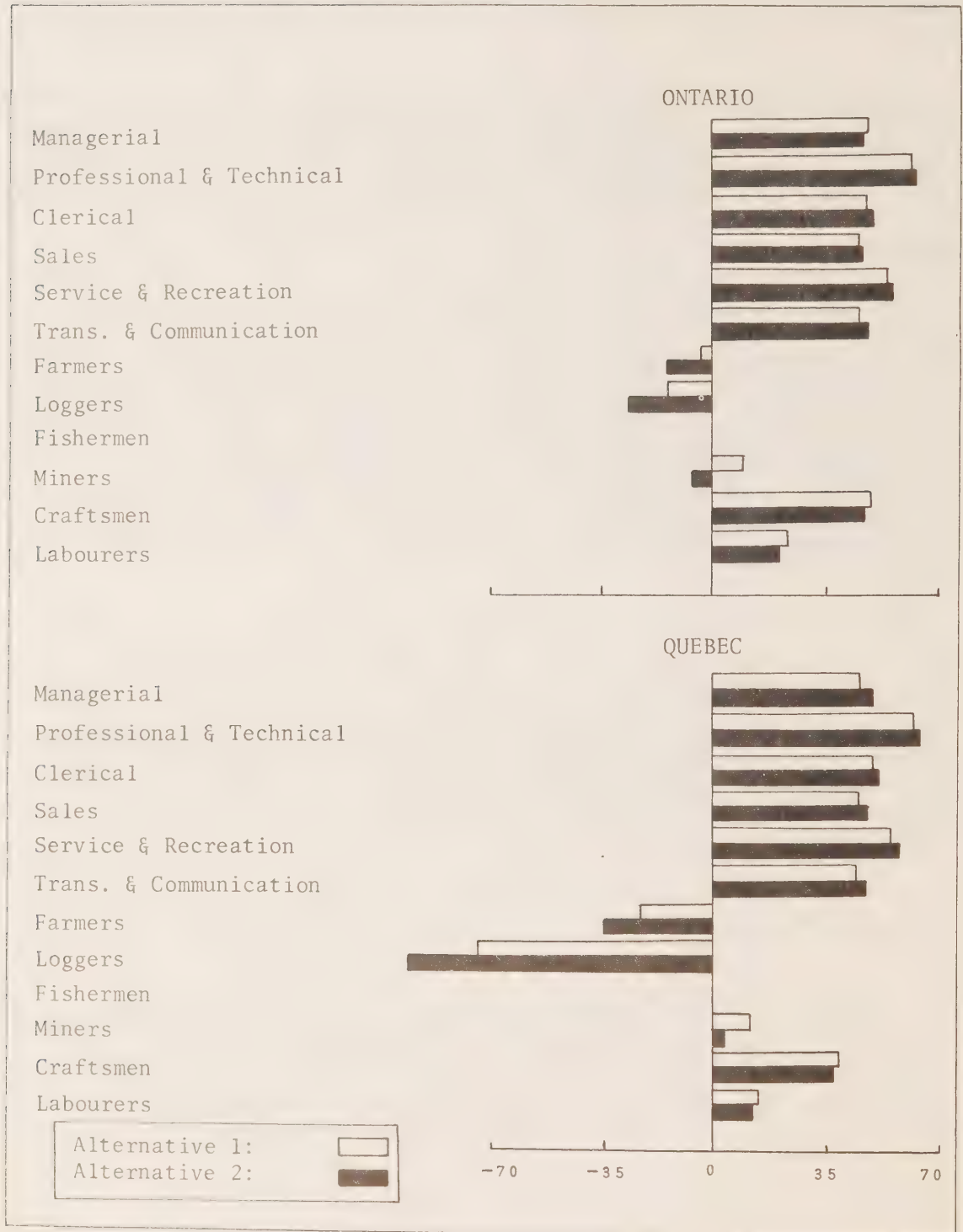
clear that future government policy will be more closely tied to the problem of reducing regional disparities than has been the case in the past.

The usefulness of the projections is governed not only by the nature of the basic method and the chosen assumptions, but also by the errors and biases in the basic data used to make the projections. They may nevertheless be used to help provide guidelines for career counselling, occupational retraining programs and both geographical and occupational mobility of manpower since they give a broad indication of future prospects in the various occupations.

Obviously the projections cannot be used as the sole input for decision-making; nor indeed can they be used indiscriminately without the application of judgement. The projections represent the technological requirements of the industrial structure and these are assumed to be independent of the supply of manpower. On the other hand, current manpower imbalances, in terms of shortages and surpluses in the various occupations, provide an indication of how manpower reacts to these requirements. Decisions thus have to be made with due regard to current labour market conditions: otherwise manpower surpluses may tend to develop in occupations for which the projected requirements are relatively high.

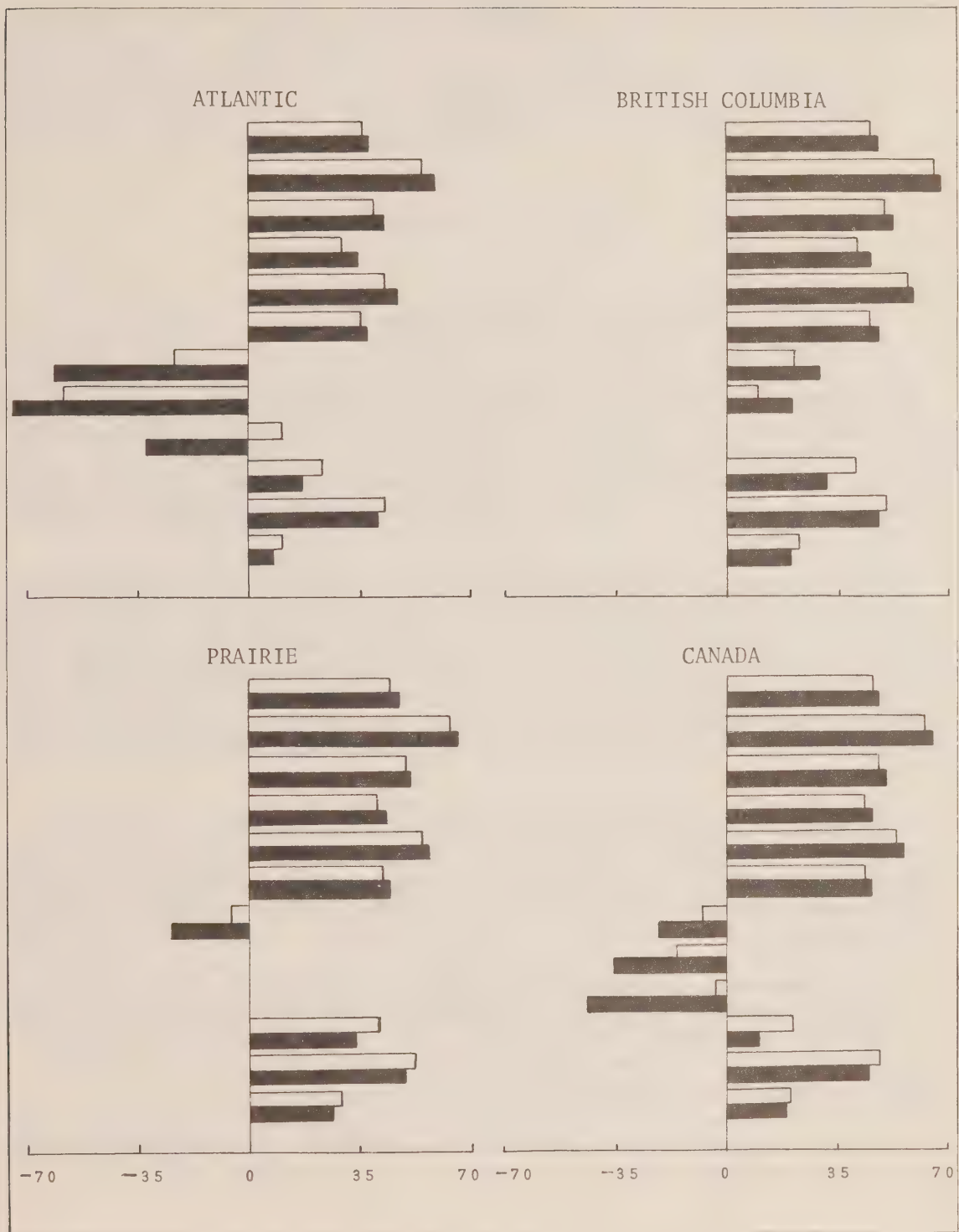
The required manpower inflow provides an indication of the manpower gap which has to be filled by the labour market making its own adjustments and by policy intervention. Obviously the training requirements for the various occupations, together with social and economic considerations will provide some constraint on the desirable and effective means of filling the gap. These are areas in which research effort has hitherto been somewhat limited and we need more information and intensive research before we can plan to fill the gap in the most efficient way.

REQUIRED MANPOWER INFLOW 1966-75 AS A PERCENTAGE
BY OCCUPATION DIVISION



OF MANPOWER REQUIREMENTS, 1975,
BY REGION

Percentages



CHAPTER 2

METHOD

I. Introduction

The processes of economic change which affect manpower are fairly simple to describe. Economic activity is generated by the final expenditures of consumers, government and business, and by the sale of exports. The volume and structure of these expenditures or final demands are in a state of constant change and respond to changes in disposable income, tastes, expectations, population, and so on.

Producers attempt to satisfy these changes in final demand by altering both the volume and structure of production. They do so by changing the proportions of the factors of production such as fixed capital, materials, power, manpower, etc. Of these, manpower tends to be the most flexible so that changes in final demand tend to result in changes in the demand for manpower. In turn, changes in the demand for manpower usually generate changes in wages and non-monetary incentives of employment.

On the supply side, manpower responds to these changes, and participation rates and hours worked tend to change in accordance with individuals' attempts to maximise welfare. As a result, disposable income changes and sets up a whole new process of adjustment in the sequence of events.

Changes may be initiated at any point in the system. For example, a change in taxation will cause a change in disposable income and hence a process of adjustment will commence. Similarly, a change in prices will cause a change in real wages and once again adjustments may take place throughout the entire system.

One such change which is particularly important for manpower planning occurs when producers change the methods and techniques used in the

production process. Such changes, generally referred to as technological change, may arise because of new discoveries, or because increased demand makes it economical to use previously unused techniques, or because of increases in managerial efficiency, and so on. The result is that the relative demand for different types of manpower may change, with the effects being felt throughout the system.

II. Quantitative Models

Such a simple description of the economic system and the role of manpower is clearly of limited usefulness. In reality, the system is extremely complex and it is difficult, and sometimes impossible, to describe what changes will occur because of a change in a given factor. Mathematical models provide a means of summarizing the description of the economic system and incorporate the more important interrelationships in a systematic way. In addition, estimates of the parameters of such models may be obtained so that the quantitative effects of a change in a specific variable may be determined.

Obviously, the usefulness of mathematical models and statistical techniques is limited since such methods implicitly assume that human behaviour is both regular and predictable, and that the economic system will not change. This assumption is often a valid approximation for some forms of behaviour, but it may lead to unreliable results in models which seek to explain the movements in variables which are determined by a number of complex forces. Manpower is one such variable and few of the quantitative models which deal with manpower have been successful.

Although explicit recognition is given to the fact that the level of employment is determined by both the demand and the supply schedules of manpower, most quantitative models assume that employment is determined either by conditions of final demand or by the available supply of manpower. In the latter case, projections of employment may be obtained by applying projected age-sex participation rates to the corresponding projected population and by assuming a given unemployment rate. In the former case, final demand determines output, and employment is then determined given the production function and the projected level of capital.

In the production function approach, both capital and manpower have, for simplicity, to be treated as homogeneous, or at least as measurable in homogeneous terms. Such models have not however been successful in

statistically explaining the observed variation in output: the variation which cannot be explained by the variation in capital and manpower (i.e. the residual variation) has been attributed to technological change. This residual factor in economic growth has been the subject of much debate and controversy (42) and attempts have been made to construct models which explicitly recognize the heterogeneous nature of capital and manpower, e.g. vintage capital models. Denison's method (9) is the most celebrated, and probably the most controversial: he has tried to estimate the contribution to growth made by a number of factors (e.g. education, hours of work, economies of scale, advances in knowledge, etc.). His estimates are based to a large degree on judgement and hence they have received much critical comment (42). They do nevertheless illustrate that the quality, as well as the quantity, of the labour force is an important determinant of growth and hence imply that manpower imbalances may hinder the growth of the economy.

For the purpose of manpower planning, the production function approach has a further disadvantage. It is clear that fixed capital per man varies considerably from one industry to the other so that in estimating the future demand for manpower, we must give explicit recognition to the changing industrial structure. However, when we disaggregate into sectors, we complicate a simple macroeconomic model since intermediate demands now become an important consideration. This raises a host of questions about relative prices and substitution possibilities between the various inputs into the production process.

An input-output model of the economy bypasses this problem by assuming that the factor input per unit of output is determined by the state of technology in the particular sector. The model thus assumes that relative prices and hence supply conditions are unimportant; but since this assumption is not fully realistic, input-output models have been subject to some criticism.

Input-output models are theoretically less sound than other macroeconomic models but they have become an important tool for efficient planning. An input-output table basically summarizes the relationship between the categories of final demand and the various sectors in the economy, and the interrelationships between the sectors themselves. It can thus be used to derive the input-output coefficients, that is the input per unit of output, for each sector, and these may then be used to derive the inputs required for any specified set of final demands.

One of the important advantages of any model is the level of internal consistency inherent in it, and this is particularly true for input-

output models. In addition, it is completely computable so that the effects of alternative assumptions or policies may be easily and quickly calculated.

It is fairly easy to include a manpower component in an input-output model (2). If we assume that the occupational input per unit of output is determined by the state of technology in any sector, then these manpower input-output coefficients may be used to calculate the occupational requirements for any specified set of final demands. Once again, however, the method is criticised for the lack of realism in its basic assumption. Hence it is argued that the occupational structure of any industry is determined not by the state of technology in that sector but by the available supply of manpower by occupation. In this case the projected manpower requirements will not be reliable since the model takes no account of the changing relative prices of occupations.

III. A Model for Substitution Between Occupations

Elementary economic theory suggests that as the price of a given factor of production rises, producers may alter the production process so that more of the cheaper factors and less of the more expensive factor will now be used. If substitution between factors is not possible, then the price of the product will tend to rise: thus, demand, and hence output, may decline. To determine which effect is predominant, we need to calculate the elasticities of substitution between the various factors of production: if these are approximately zero, then producers will tend to adjust output to changes in relative prices.

In the context of manpower, this type of analysis appears to be valid if we regard an occupation as a homogeneous factor of production. In this case the high mobility of individuals between occupations indicates a high degree of substitutability between factors of production. Hence an input-output model will not provide reliable projections of manpower requirements.

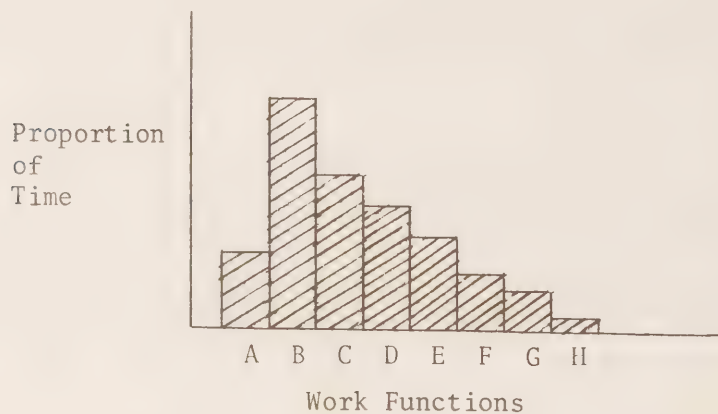
The validity of the criticism rests on the assumption that an occupation may be regarded as a homogeneous factor of production. Mere observation suggests that this is not so. An individual may be called upon to perform a variety of operations, or work functions, in the performance of his job, and it is these work functions which are necessary inputs for the production process. An occupation is defined as the

type of work involved in a job and is thus associated with the most important work function in the job. Thus it seems reasonable to assume that work functions will not be uniquely associated with occupations and that there will be some overlap in the work functions required in different occupations.

For example, the occupation 'attendant, doctor's office' may be made up of the following work functions: answering telephones, general assistance, specific assistance, typing, keeping and remitting accounts, etc. Thus the occupation will have work functions in common with the following occupations: telephone operator, nurse, bookkeeper, etc. Other examples may be used as further illustration: a civil engineer may have work functions in common with other engineers, draughtsmen, etc.; stenographers with receptionists, telephone operator, etc.; salesmen with chauffeur, delivery man, etc.; maid with cook, babysitter, etc.; farmer with tractor driver, labourer, etc.; carpenter with sawyer, cabinet maker, etc.; jeweller with engraver, sales clerk, etc.; and so on.

It seems more appropriate then to regard the work function rather than the occupation as the homogeneous factor of production. An occupation is made up of a combination of heterogeneous work functions and this combination will tend to vary from one job to the other. For example, an individual employed in a small firm may be called upon to perform a large number of unrelated work functions. On the other hand, greater specialization is possible in large firms so that less variability in work functions may be necessary.

Since work functions are probably discrete, we may represent an occupation by a distribution of work functions as in the diagram;



we can see here that a specific job is represented by the proportion of time to be spent on work functions A to H. The most important work function, that is the mode of the distribution, is B so that the occupation associated with this particular job is determined with reference to B.

If we assume that substitution between factors of production, that is work functions, is possible, then changes in the relative prices of work functions may result in changes in the work function distributions of jobs. For example, if the price of B rises, then the production process may be altered so that less of B is now necessary in the production of the same output. Thus the work function distribution of the job illustrated in the diagram may tend to change, but this will change the occupation associated with the particular job only if the modal work function changes.

If the work function distribution of a job is fairly uniform, that is if the modal work function is not clearly defined, then a small change in relative prices may change the mode of the distribution and hence the occupation associated with the particular job. On the other hand, if the distribution has a sharp peak the occupation associated with the job may change only if the change in relative prices is large. Hence substitution between occupations will take place only if (i) the relative prices of work functions change substantially, or (ii) technology changes rapidly, or (iii) the distribution of work functions is fairly uniform.

IV. Matching of Individuals and Jobs

Units of work functions are available only through the employment of human resources and hence the model must be extended to include the matching of jobs and individuals. To do so we assume that efficient performance of a work function requires a given set of characteristics of manpower, e.g. ability, formal education, training, experience, sex, and so on. Optimization then implies that individuals and jobs must be matched so that the characteristics possessed by an individual are just those required for performance of the work functions necessary in the given job.

A diagrammatic representation may help to illustrate. Assume that the available jobs are made up of a combination of only three work functions, and that each of these work functions is associated with a combination of only five characteristics. Let 1 represent presence and

0 absence of a characteristic or work function. We may visualize a table like the one shown, with two available jobs and three available individuals.

Thus, characteristics X_1 , X_2 and X_4 are necessary for performance of work function A; similarly, X_1 and X_3 are necessary for B, but only X_5 for C.

Characteristics	Work Functions			Individuals		
	A	B	C	1	2	3
X_1	1	1	0	1	0	0
X_2	1	0	0	1	1	1
X_3	0	1	0	1	0	1
X_4	1	0	0	0	1	0
X_5	0	0	1	0	0	1
Jobs	1	1	1	0		
	2	0	1	1		

Jobs 1 and 2 necessitate the performance of functions A and B, and B and C respectively. Since it is unlikely that the individuals available for jobs will possess just those characteristics necessary for the performance of the available jobs, we may expect distributions like those shown.

In allocating individuals to jobs, rational employers will, in the absence of institutional or legal restrictions, seek to minimize the cost of mismatching. If we assume that the price of each characteristic is determined in the market by demand and supply of characteristics, and let p_1, p_2, p_3, p_4, p_5 denote the prices of x_1, x_2, x_3, x_4, x_5 respectively, then the cost of mismatching may be calculated. For example, the cost of work function A is $(p_1 + p_2 + p_4)$ while that of work function B is $(p_1 + p_3)$. The minimum cost of job 1 is thus $(p_1 + p_2 + p_3 + p_4)$. The wage paid to individual 1 is $(p_1 + p_2 + p_3)$ so that if individual 1 were employed in job 1, the cost of mismatching would be $-p_4$. Individual 1 is then over-utilized in the sense that he does not possess all the characteristics necessary for the efficient performance of job 1.

Such mismatching of individuals and jobs will not be acceptable if the loss in productivity is high. For example, if the production process is such that work function A is performed most of the time, the

absence of C_4 in the individual employed in the job may lead to high losses in productivity. In contrast, the reverse will be true if work function A is relatively unimportant in the production process.

V. Summary of the Model

To summarize, we are suggesting that individuals possess certain characteristics which are necessary for the efficient performance of work functions or inputs for the production process. The wages of individuals and the prices of work functions depend on the prices of these characteristics. The latter are determined in the market by demand and supply so that an increase in supply may cause a fall in the price of a particular characteristic. In turn, the prices of work functions requiring this characteristic will tend to fall, thus inducing producers to alter the process of production. As a result, the distribution of work functions will tend to change; but this will not result in a change in the occupation associated with a given job unless the change is sufficiently large to alter the mode of the work function distribution.

The model may be used to explain some of the more important observations about the labour market. For example, the variation of wages within an occupation may be explained by the variation in the characteristics possessed by individuals in that occupation. Similarly, the apparent educational upgrading of individuals makes good sense in terms of the model. As the availability of education increases, the supply of educational characteristics will tend to rise. Producers are thus induced to alter their production process to use more work functions requiring the now relatively cheaper education characteristics. The new work function distributions will not necessarily lead to occupation changes so that the education associated with occupations will tend to rise.

The model has only been sketched out roughly and there obviously is a need for more careful and critical scrutiny. Certain conceptual problems also need to be considered; for example, we need to specify exactly what we mean by work functions and characteristics so that they may be measured for empirical research. The model does however indicate an area of much needed research in the field of manpower planning. The present practice of regarding occupations as homogeneous factors of production is clearly inappropriate, and we need to learn more about

how employers determine the characteristics of individuals required for specific jobs.

The model suggests that it is possible to have both high substitutability of factors of production (i.e. work functions) and high mobility of individuals between jobs and occupations without necessarily having a high degree of substitution between occupations. This is an important consideration in the making of occupational projections, since it implies that fairly reliable projections may be obtained using the input-output approach.

VI. Method Used for the Present Projections

The Dominion Bureau of Statistics is in the process of preparing an input-output table for the Canadian economy in 1961 (23). When it becomes available it will be possible to make use of it in a model to provide projections of manpower requirements by occupation. The construction of such a model is both time consuming and expensive because of the high degree of technical complexity, and it will probably be several years before a model can be completely operational.

In the meantime, projections of occupational requirements may be obtained by using a variant of the input-output approach. For example, we may calculate occupational inputs per unit of output by using estimates of net output, or value added, which are normally available on a year to year basis, instead of the gross output, or sales, available in an input-output table.

Our present projections program has been designed with two aims in mind. The first of these was to provide, by late 1969, projections of occupational requirements for Canada and for each of the five economic regions for 1975, as an aid to more efficient manpower planning. The projections cover the entire range of occupations and thus form a comprehensive framework within which other projections may be made. Our second aim was to obtain some experience in the area of manpower projections, with respect to both the technique of projection and familiarity with available data, for planning future programs of research.

The method used in the present study was chosen after careful consideration of the available data. Detailed occupation by industry statistics are available only in census years but these are not comparable from one year to the next because of changes in both the occupational

and industrial classifications used (11, page v-ix). The data have already been converted to the classification basis of the 1951 census (40) but, because of the new classification basis for current data we had to convert the census data to the occupational and industrial classifications used in the 1961 census (1). The conversion procedure is extremely time consuming and, because of our time constraint, the conversion was limited to data for the twelve main industries, for Canada as a whole, and for the censuses of 1941 and 1951.

The conversion procedure is merely a process of re-classification of existing data to a new classification basis. Thus conceptual differences between the censuses still exist so that the data are not strictly comparable over time. For example, the censuses of 1951 and 1961 were based on the labour force concept while that for 1941 was based on the gainfully occupied concept. The chief difference between the two is that an individual's occupation is determined with reference to a specified period in the former but not in the latter. Thus the occupational statistics will tend to differ between the two concepts and especially so for seasonal and female occupations.

In order to reduce these biases, we decided to work with the proportion that each occupation forms of each industry rather than with the absolute number in each occupation-industry cell. This meant that we added a third step in the projection method. In the straightforward method, projections of occupational requirements are obtained by projecting output and occupational employment per unit of output separately. In the method we have adopted here, we obtain occupational projections by projecting output, occupational employment as a proportion of total employment, and total employment per unit of output.

In mathematical terms, let E_{ij} be employment in occupation i and industry j , y_j be total employment in industry j , and 0_j be output in industry j . Then,

$$E_{ij} = \frac{E_{ij}}{0_j} \cdot 0_j \quad (A)$$

$$= \frac{E_{ij}}{y_j} \cdot \frac{y_j}{0_j} \cdot 0_j \quad (B)$$

where (A) and (B) correspond to the two projection methods.

Consider errors in E_{ij}/O_j which arise from errors in E_{ij} . If we let the error in E_{ij} by ΔE_{ij} , then the relative error in E_{ij}/O_j is:

$$\left[\frac{E_{ij} + \Delta E_{ij}}{O_j} - \frac{E_{ij}}{O_j} \right] \div \frac{E_{ij}}{O_j}$$

for method (A) and this reduces to the same as the relative error in E_{ij} , that is $\Delta E_{ij}/E_{ij}$. In method (B), E_{ij}/y_j is measured from the census data and hence errors will exist in both E_{ij} and y_j . Thus if this error in y_j is Δy_j , then the relative error in E_{ij}/O_j is:

$$\left[\frac{E_{ij} + \Delta E_{ij}}{y_j + \Delta y_j} \cdot \frac{y_j}{O_j} - \frac{E_{ij}}{O_j} \right] \div \frac{E_{ij}}{O_j}$$

which reduces to $\left[\frac{1 + \frac{\Delta E_{ij}}{E_{ij}}}{1 + \frac{\Delta y_j}{y_j}} \right] - 1$, (y_j in y_j/O_j is obtained, not from the

census, but from annual employment surveys, and therefore can be assumed to be error-free). This reduces to $\Delta E_{ij}/E_{ij}$ the error in method (A), only if $\Delta y_j/y_j$, the error in y_j , is zero. In fact, as we noted above, conceptual differences between the censuses will tend to cause biases for some occupations and industries, e.g. occupations and industries with high proportions of female workers. In these cases $\Delta E_{ij}/E_{ij}$ and $\Delta y_j/y_j$ may both be large and method (B) will therefore tend to reduce such biases.

The chosen method (B) has other advantages. The census occupation-industry data refer to the labour force rather than to the employed, from which employment by occupation and industry may be obtained by applying occupation-industry specific unemployment rates. But as these are not available, some simplifying assumption is necessary. In method (A) we have to assume that the unemployment rate is the same for all occupations and industries, while in method (B) we can assume that within any industry, the unemployment rate is constant for all occupations: no assumptions about unemployment rates in different industries are therefore necessary in method (B).

The use of the occupational structure of the labour force rather than that of those employed is preferable because employment is much more sensitive than the labour force to short-run changes in economic conditions. Thus use of the occupational structure of the labour force tends to reduce the influence of cyclical effects. This is important since the years 1941, 1951 and 1961 represented three very different points in the Canadian economic cycle: war year, peak year and slack year respectively.

Our projection method thus consisted of projecting (a) the occupational structure, (b) total employment per unit of output and (c) the level of output in each industry. In making regional projections, the last two steps had to be collapsed into one step since estimates of output by industry and region are not currently available. In this case, employment by industry was projected directly.

National projections of the occupational structure of each industry were obtained by simple trend extrapolation of the occupational structure observed in the census years 1941, 1951 and 1961. However, as we mentioned above, comparable occupation-industry data for 1941, 1951 and 1961 were prepared only for Canada, so that some other means had to be found for obtaining regional projections. These were obtained by applying the rates of change projected for the national occupational structure in the period 1961-75 to the regional occupational structures in 1961 (46, Volume 1). The basic assumption here is that the rate of change of technology, and hence of the occupational structure, of each industry, is constant from one region to the other.

The assumption is not completely valid for a number of reasons. For example, because of regional disparities in income and hence demand, there will clearly be differing incentives for the application of new or existing techniques of production in the various regions. Similarly,

the industry divisions with which we are dealing here are rather highly aggregated, so that regional differences in the structure within industries may be large; for example, the mining industry in the Atlantic and Prairie regions differ substantially.

At the outset it was evident that since consistent projections can only be obtained by using an economic model which specifies the important interrelationships of the economy, a great deal of judgement would be necessary to ensure that the projections make good sense. We therefore deliberately chose to make our initial projections in a simple way which allowed some freedom in the choice of the actual projections. This appeared to rule out the use of regression analysis; our initial projections were arrived at by visually fitting the 'best' straight line through the logarithms of the time series observations.

Our dismissal of the usefulness of simple regression analysis in making our projections will obviously meet with some criticism. For example, it may be argued that more statistically reliable projections of, say, output in the manufacturing sector could have been obtained by regressing output on time and a cyclical adjustor like the unemployment rate. This may well be so; but we feel that a single regression estimate which is 'best' in the statistical sense would have given a spurious indication of the accuracy of our projections. It would also have given a misleading impression of the projection concept by failing to show the possibility of alternative future developments. In addition, as we shall see in Chapter 4, the basic data on output and employment with which we have had to work are subject to non-random errors which, in our opinion, are large enough to invalidate regression results.

The method we have used in this study thus suffers from several defects necessarily incurred in producing it quickly. To try to make up for them, the projections have been subject to careful scrutiny and discussion with knowledgeable and interested economists in universities, industry, and federal and provincial government departments. Our final projections thus take account of opinions about future economic developments expressed both in these discussions and in published studies.

CHAPTER 3

THE ECONOMIC SETTING

The procedure of simply extrapolating the relevant variables over time is extremely hazardous since it basically assumes the continuation of past trends, not only in these variables themselves but also in other important variables not explicitly considered. For example, in extrapolating the trend in output, we assume implicitly that the trends in consumption, investment, exports and income will continue into the future. It is obviously not satisfactory to make these extrapolations completely mechanically, and some investigation of the historical growth of the economy is necessary to ensure that the continuation of past trends appears to be a reasonable assumption. This is a subject to which we now turn.

I. Canada's Long-Term Economic Growth

Generalization about the factors responsible for the economic growth and development of a country is very difficult. Rapid growth depends on the discovery and exploitation of natural resources, the development of adequate financial capital and fixed investment, technology and an adequate supply of manpower endowed with the necessary skills.

These factors have all contributed substantially to Canada's long-term economic growth (30). In the early decades of the nineteenth century, the vast distances and physical barriers between the five economic regions severely limited the growth of interregional trade and the economic development of the interior. The economies of the eastern regions - Atlantic, Quebec, Ontario - prospered because of the high demand for fish, lumber, minerals and agricultural products in world markets and especially in Britain and the eastern United States.

With confederation and the later extension of the railway, the settlement of the Prairie region and the development of wheat farming progressed rapidly. Rising prices in world wheat markets made it possible for wheat production and exports to increase enormously, especially after 1900. The British Columbia economy received a boost at the turn of the century with the opening of the Panama Canal: the price of western lumber fell substantially and demand increased accordingly.

Canada's population has also increased rapidly: in the century of confederation, the population increased six-fold from about $3\frac{1}{2}$ million to 20 million. Most of this was due to an almost constant rate of natural increase, although net immigration did in fact contribute substantially at different points in time (8, page 47). These tended to coincide with periods of economic difficulty in Europe.

The rapid increase in population and shifts in consumer spending patterns associated with rising incomes created a larger domestic market for consumer goods and hence potential economies of scale in the manufacturing sector. The developing manufacturing industries received a further stimulus through the high protection from overseas competitors afforded by tariffs. Output and employment in the manufacturing sector grew rapidly, and especially so at the beginning of the present century. The share of employment in the primary sector, agriculture, forestry, fishing and trapping, mining, tended to fall: in 1881, agricultural employment represented nearly 50% of total employment, but this had fallen to about 25% by the end of the second world war.

Though the capital-output ratio rose only slightly over the century, capital per man increased enormously (34, pages 39-50): as a result, labour productivity increased sharply. The intensification of capital resources both caused and resulted from changes in the skill structure of the labour force. Technological change was generated by the growth in scientific knowledge and professional and technical manpower, while the increasing complexity of the production process called for the development of manpower with new and increasing skills.

Changes in the occupational structure of the labour force were generated by changes in technology and in the industrial structure of employment. Employment of unskilled blue collar workers, mainly labourers, continued to grow rapidly until about the second decade of the twentieth century; but in the past 40 to 50 years the growth of skilled workers has dominated the increase in blue collar occupations.

Employment in the primary occupations and especially of farmers and farm workers decreased rapidly, while that in white collar and service occupations increased enormously. Most of the increase in employment in white collar occupations has been attributed to the changing occupational structure rather than to the rapid growth in the total labour force (43, page 5): for example, the number of males in professional occupations increased by over 300,000 between 1901 and 1961 and over 200,000 of this net increase stemmed from the change in the labour force composition between these two dates (43, page 6).

II. Post-War Economic Development

These structural changes in the Canadian economy continued in the period after the second world war as it moved into a state of 'high mass consumption and technological maturity' (30, page 5). Output and income showed large increases and so did the demand for consumer durables and health, education and welfare services.

In the twenty years to 1966, real domestic product increased by more than 50% (18): almost all of the major industries shared in this increase though some grew faster than others (Figure 3.1). The rate of growth was greatest in public utilities and mining, and most of the other industries (except agriculture, forestry, fishing and trapping) expanded at roughly the same average rate of between 4% and 5% per annum. Manufacturing, trade and transportation showed strikingly similar cyclical patterns over the period, while agriculture, forestry and fishing and trapping showed marked year to year fluctuations. The trends in most of the service-producing industries were fairly smooth and, although the growth in the service sector was lower than average, and growth rates of some of its components, for example business services, education, hospitals, hotels and restaurants, were among the highest in the economy.

The share of output produced by the manufacturing sector increased by roughly one-sixth (Table 3.1), while that of agriculture and the service-producing industries declined slightly. At the same time, the share of employment in agriculture decreased drastically, while that in the service-producing industries increased substantially; by 1966, the share of employment had fallen to 7.9% in agriculture, but had risen to 58.6% in the service-producing industries.

FIGURE 3.1

42

ANNUAL AVERAGE RATE OF GROWTH IN REAL GROSS
DOMESTIC PRODUCT BY INDUSTRY, 1946-1966

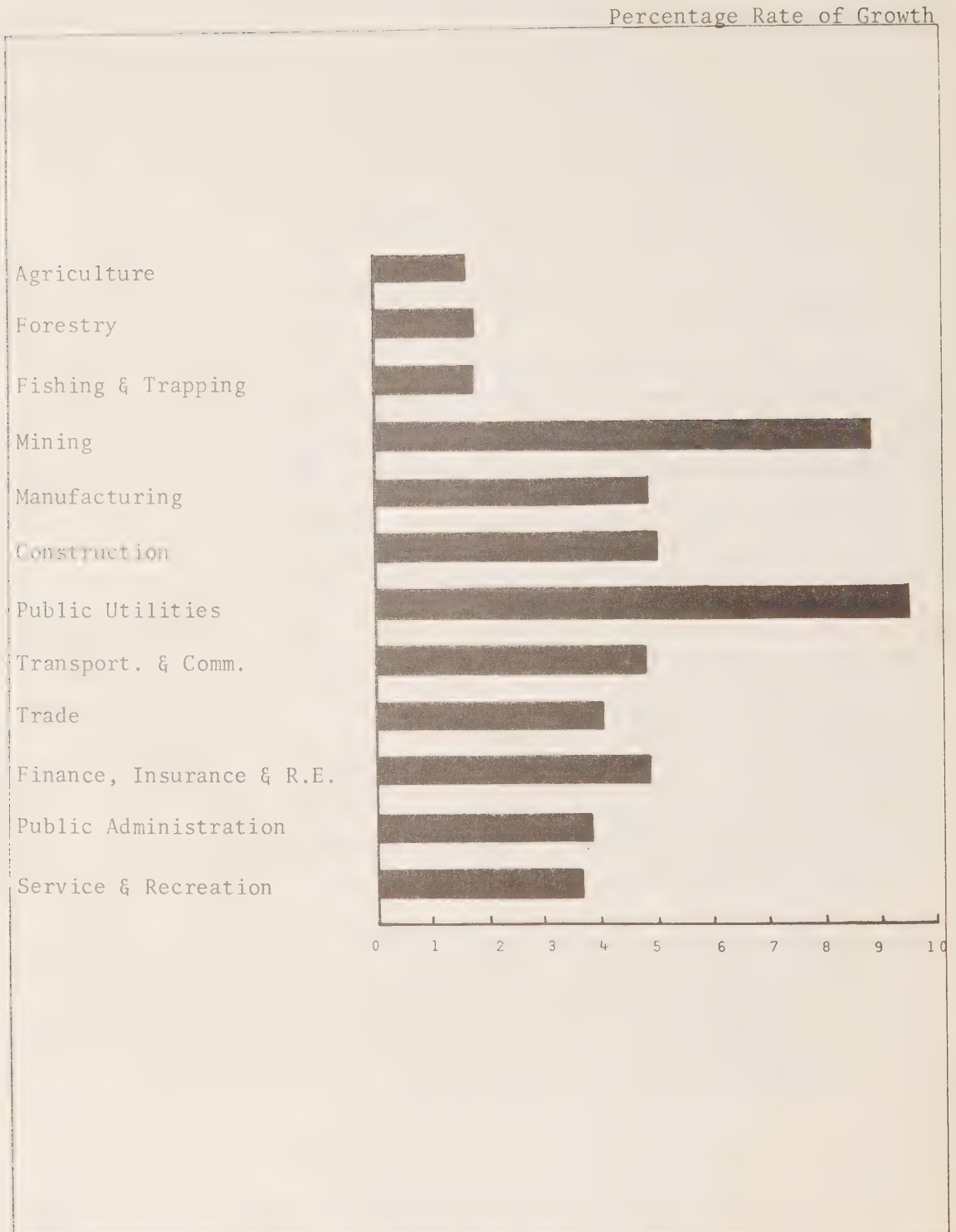


TABLE 3.1

INDUSTRIAL STRUCTURE OF OUTPUT AND EMPLOYMENT

	Percentages			
	Percentage share of gross domestic product		Percentage share of employment	
	1946	1966	1946	1966
Agriculture	8.6	5.1	25.6	7.9
Manufacturing	24.6	28.4	23.2	24.0
Service-producing Industries (a)	57.0	51.6	41.1	58.6
All Industries	100.0	100.0	100.0	100.0

(a) Includes transportation, storage and communication; trade; finance, insurance and real estate; service; public administration and defence.

Between 1941 and 1966, the total population of the country increased from 11.5 million to 20.0 million (22, page 191) and this alone meant an enormous increase in the demand for consumer goods and services. In addition, the economy received a further stimulus in the early post-war years through both the baby-boom and the back-log of war-deferred consumption and investment demand. Other events, e.g. the Korean war and the investment boom of the mid-fifties, provided some of the fuel necessary to maintain the rate of expansion. This increase in aggregate demand exceeded the increase in supply which was possible with the limited resources in the economy, leading to rising prices and costs and hence to a weakening of Canada's international competitive position and balance of payments.

After devaluation and stabilization of the Canadian dollar in mid-1962, the economy moved once again into a period of rapid expansion. Imports rose relatively less than in previous expansions and the domestic market became more important. This shift in the relative importance of domestic demand was partly due to the higher rate of household formation associated with persons born in the immediate post-war years.

Such changes in the composition of demand have had important effects on the structure of industrial output. In the post-war period imports roughly maintained a constant proportion of Gross National Product; on the other hand the share of exports fell from 27.1% in 1946 to 22.3% in 1966 (22, page 1,071). Exports form a large part of total output in the primary industries, and these have therefore been adversely affected by the relative rise in domestic demand.

The structure of Canadian exports has also changed sharply in more recent years. World trade in manufactured goods has increased in response to rising prices and declining tariffs, and manufactured goods now represent a higher proportion of Canadian merchandise exports. A large part of the increase in merchandise exports is due to the rise in exports of automobiles and spare parts associated with the Automotive Agreement with the United States.

Other important changes in the composition of demand took place in the post-war period. Incomes increased and tastes continued to change partly as a result of the accelerating drift towards the urban centres. The demand for consumption goods and services changed significantly: the demand for health, welfare and education services increased in importance and so did the demand for consumer durables, e.g. automobiles and electrical appliances.

Changes in demand were also generated by changes in technology. New products, e.g. television, were created and these in turn created new demands. Improvements in production and management caused reductions in relative prices of specific goods, e.g. air transport, and these led to large increases in demand. Industries became more capital intensive and hence the manufacturing sector gained due to the increase in the demand for fixed capital.

III. Changes in Productivity

Technological change may occur through the discovery and development of a new process of production or product, or through the adoption of previously uneconomical techniques, or through increased rationalization and reorganization, and so on. In every case, technological change depends on the growth and application of scientific and technical knowledge and hence on the quality and quantity of research effort. Research and development depend in turn on the presence of manpower competent to develop, apply and control the use of capital resources and technology in the production process.

Changes in technology often mean that a given level of output can be produced with less manpower and hence that the labour input per unit of output falls. Labour productivity grew rapidly in the post-war period, and in the primary industries the increases were particularly striking. In the period 1946-66, output per man grew by 5.6% per annum in agriculture and by 3.8% per annum in commercial non-agricultural goods-producing industries; in commercial service-producing industries, the rate of growth was a modest 1.1% per annum.

Substantial rationalization and reorganization have taken place in the agricultural sector. The number of farms has been reduced and the resulting increase in farm size has paved the way for gains in output per man through both increased mechanization and improved management. Specialized production has also increased and this has led to improvements and economies in the processing and marketing of farm products.

Significant changes have also occurred in the structure of the forestry industry. Mechanization has been taking place at a rapid rate: the power saw has reduced human effort and tractors and rubber-tired skidders have been replacing the horse (7). In addition, transportation methods have improved and management efficiency has increased.

Output in the fishing industry depends to a great extent on the vagaries of nature. Productivity changes therefore tend to show no marked trend even though there have been increases in efficiency. Offshore fishing has become fairly capital intensive and small-scale inefficient producers are apparently being replaced by larger more efficient ones (4).

The mining industry has also become highly capital-intensive because of the growing importance of petroleum and natural gas, and output per man has increased sharply. Productivity gains have been so large that employment actually fell in the period 1957-63 even though output continued to increase. The industry has however become more diversified and exploration and development have increased so that employment has now returned to the level of the mid-fifties.

Despite these improvements in labour productivity, there appears to be a large and persistent gap between the levels in the United States and Canada. Various studies have shown that the gap is much wider for the manufacturing sector than for the economy as a whole, and most of it appears to arise because of differences in scale and specialization.

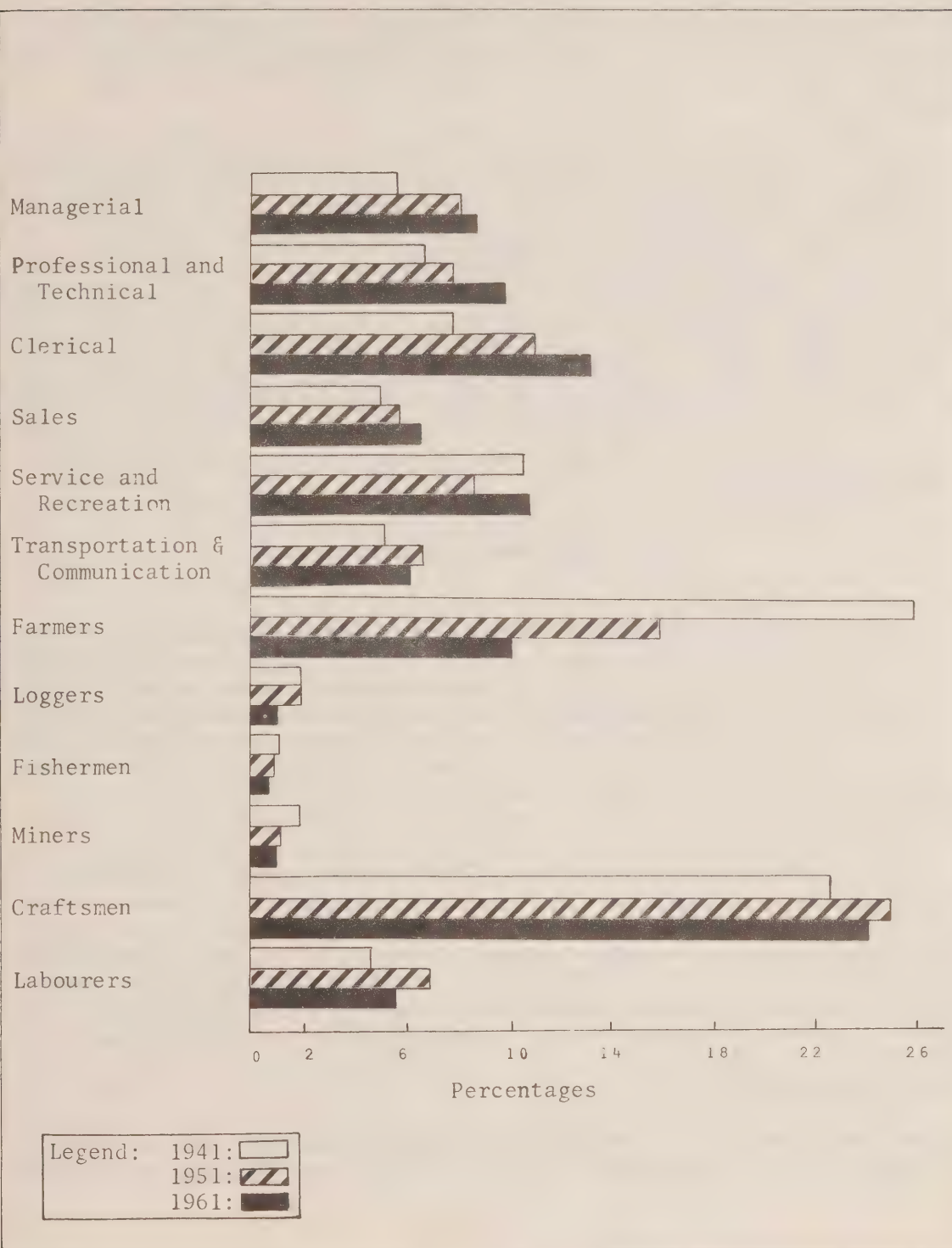
One recent study (27, page 165) suggests that short production runs and high product diversification in Canadian manufacturing have helped to keep costs and prices high and productivity low. Tariffs have contributed to this inefficiency because of the limitation on the size of markets for Canadian manufacturing goods and because of the limited effectiveness of competition on the domestic market. Recent agreements under the General Agreement on Tariffs and Trade to substantially reduce the level of tariffs on industrial products will therefore offer opportunities for greater efficiency in scale and specialization and hence for gains in labour productivity.

IV. Occupational Structure of the Labour Force

Changes in the technological structure of industries and in the industrial structure of employment have generated large changes in the occupational structure of the labour force (39, page 84).

Between 1941 and 1961, the proportion of the labour force in the primary occupations decreased substantially (Figure 3.2). The most striking decline was for farmers and farm workers and their relative importance fell from 25% in 1941 to 10% in 1961. The decline for loggers, fishermen, miners and labourers was much less substantial; in 1941 they comprised 11% of the labour force, while in 1961 these occupations formed 8% of the total.

DISTRIBUTION OF THE LABOUR FORCE BY OCCUPATION
DIVISION FOR CANADA: 1941, 1951 AND 1961



The share of the labour force in clerical occupations showed the largest increase over the twenty-year period. The percentage share of this occupation increased from 7.5% in 1941 to a little over 13% in 1961. This is closely associated with the rapid increase in female participation rates and the increasing incidence of part-time employment.

The increases in managerial, professional and technical, and sales occupations were also substantial: these reflect both the changing technological requirements of industries and the increasing importance of the service-producing industries. The managers comprised over 5% of the labour force in 1941 but in 1961 they formed nearly 8%; the professional and technical occupations increased from nearly 7% to just under 10% of the labour force; and the salesmen increased their strength from 5% in 1941 to over 6% in 1961. The transport and communication workers also increased their strength from 5% in 1941 to 6% in 1961, while the craftsmen increased from 22% of the labour force in 1941 to 24% in 1961. In the service and recreation occupations, the growth was minimal, and they remained around 10% of the labour force during this period.

V. The Importance of Factor Inputs

One of the most significant features of Canadian economic growth in the post-war period is the importance of the growth of inputs of capital and labour. According to estimates made by the Economic Council of Canada (28, page 20), the growth in factor inputs accounted for slightly more than 71% of the growth in real national income in the period 1950-62: the growth in capital represented a little less than half of this contribution. An adequate supply of both capital and labour has therefore been a crucial factor in Canadian economic growth.

Historically, foreign funds have played a vital part in providing the investment necessary for continued economic growth in Canada. In the post-war period, United States' investments in Canada became particularly important mainly because of the rise in direct investments in companies controlled from the United States (22, pages 1,086-1,087). This is especially true for firms in the manufacturing and mining sectors; however, resident Canadian capital has been more important in such sectors as agriculture, trade, utilities and in housing and social capital developments.

On the manpower side, the labour force has increased partly because of high levels of immigration. In the 1961 census, 1.5 million persons

stated that they had arrived in Canada in the period 1941-61: this represented about $7\frac{1}{2}\%$ of the total population. However, there have been wide fluctuations in the annual arrivals of immigrants.

Changing social attitudes, especially to working married women, have caused recent rapid increases in participation rates for females, and hence have contributed to the growth in the labour force. Participation rates for all females grew by only 0.8% in the period 1946-56 but by 32.8% in the period 1956-66 (12). This enormous increase in female participation in the labour force has both sustained and been sustained by the rapid growth in the service-producing industries. Part-time work increased in these industries and hence average hours worked fell substantially: thus output per man increased only slowly. Male participation rates have, in contrast, showed a decrease over the period. This was due in part to the decline in the age of retirement and to rising school enrolment in the younger age groups.

Recent analyses and evidence have suggested that the quality of the labour force may be an important determinant of economic growth (9). As a result, several attempts have been made to separate out the contribution that formal education has made to past growth. For Canada it has been estimated that the improved education of the labour force accounted for 11.4% of the growth in real national income in the period 1929-57 (5, page 56); for the United States, the contribution over the same period was estimated to be 23% (9, page 73). In contrast, the contribution of education has been estimated to be 5% for Canada and 15% for the United States for the period 1950-62 (27, page 12). Thus the differential between the two countries appears to have widened in the past 50 years or so.

Several factors are responsible for these differences. During the period 1910-1960, average years of education per person in the male labour force in the United States rose at an annual average rate of between 9% and 10%; but for Canada, the rate of increase was only 5% to 6% (30, page 86). Similarly, about 11% of the United States' male labour force, but only $5\frac{1}{2}\%$ of the Canadian labour force, had university degrees in 1960-61; and of the age-group 25-34, 45% in the United States and 24% in Canada (30, page 86) had secondary school education or more in the same period.

Canadian per capita expenditure on education was about the same in money terms in 1945 as in 1926. This meant, because of the rise in prices, that real per capita expenditure on education had fallen considerably by the end of the last war. As a percentage of Gross National

Product, expenditures on formal education fell from 2.7% in 1926 to 1.6% in 1946 (30, page 50). However this has increased substantially in the post-war period: in 1950 the proportion was still only 2.6% but this had increased to 6.5% in 1966 (30, page 52).

The full effects of this striking increase in investment in education will obviously be reflected in the educational structure of the labour force after a number of years. Improvements have, however, already appeared: in the decade to 1961, average (median) years of school rose by almost one year from 8.5 to 9.4 (43, page 37). Similarly the proportion of the labour force with at least a secondary school education increased from 10.3% in 1951 to 16.3% in 1961: at the same time, the proportion with only an elementary school education fell from 49.3% to 40.5% (43, Table 13).

These changes in the educational structure of the labour force reflect both an upgrading of the educational levels within the various occupations and a change in the occupational structure towards more highly qualified manpower. It has been estimated that two-fifths of the 1951-61 increase in the median years of schooling for males and one-third for females can be attributed to the changes in the occupational composition (43, pages 37-38).

The educational structure of the various occupation divisions are illustrated diagrammatically for 1961 in Figure 3.3. In the white collar occupations the labour force was made up mainly of persons with at least high school education; for the professional and technical division, almost two-thirds of the labour force had at least secondary school education. In contrast, in the blue collar occupations, the labour force had no more than an elementary school education.

VI. Regional Economic Growth

Reliable measures of output by region are not currently available so that some other means of measuring regional economic performance has to be used. The best available alternative is the level of personal income, which excludes undistributed corporation profits and includes transfer payments and hence differs from Gross Domestic Product; rates of growth of personal income can therefore provide only a very rough indication of regional economic growth.

Comparisons may be made in terms of either total personal income or personal income per capita (Table 3.2). Over the post-war period, the

TABLE 3.2

GROWTH OF PROVINCIAL PERSONAL INCOME AND POPULATION

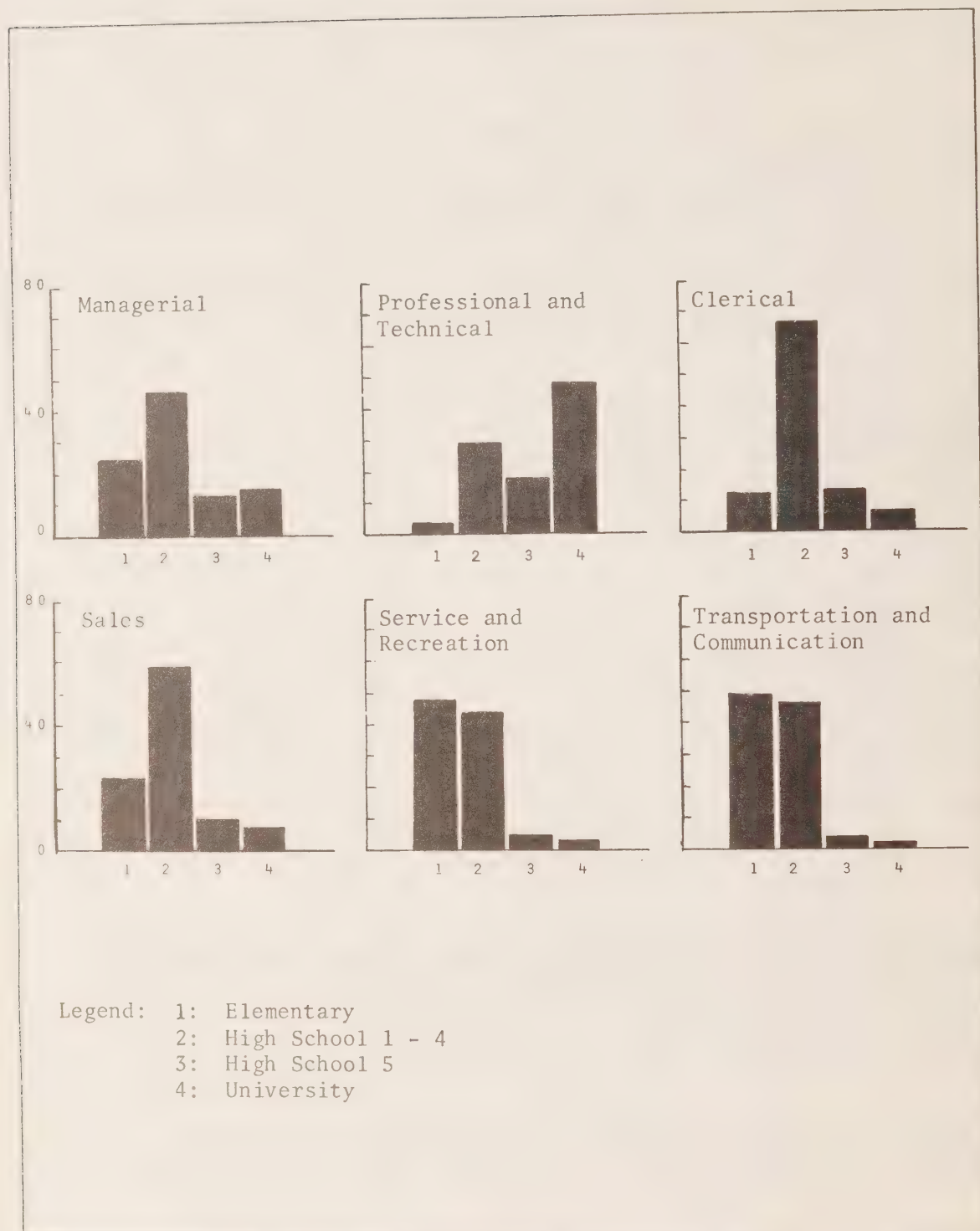
Percentage rates of growth

	Personal Income per Capita	Total Personal Income	Population
Ontario	4.6	7.5	2.8
British Columbia	4.4	7.7	3.1
Alberta	4.1	7.6	3.4
Saskatchewan	4.9	5.6	0.7
Manitoba	4.3	6.0	1.6
Quebec	4.9	7.5	2.5
Nova Scotia	4.2	5.5	1.3
New Brunswick	4.1	5.6	1.4
Prince Edward Island	5.4	6.3	0.8
Newfoundland	5.3	7.8	2.4

Note: Provinces are ranked in order of average personal income per capita for 1962-64; the growth rate was calculated using averages for 1946-48 and 1962-64 for all provinces except Newfoundland, (1949-51 and 1962-64).

Source: Economic Council of Canada, Second Annual Review, page 108.

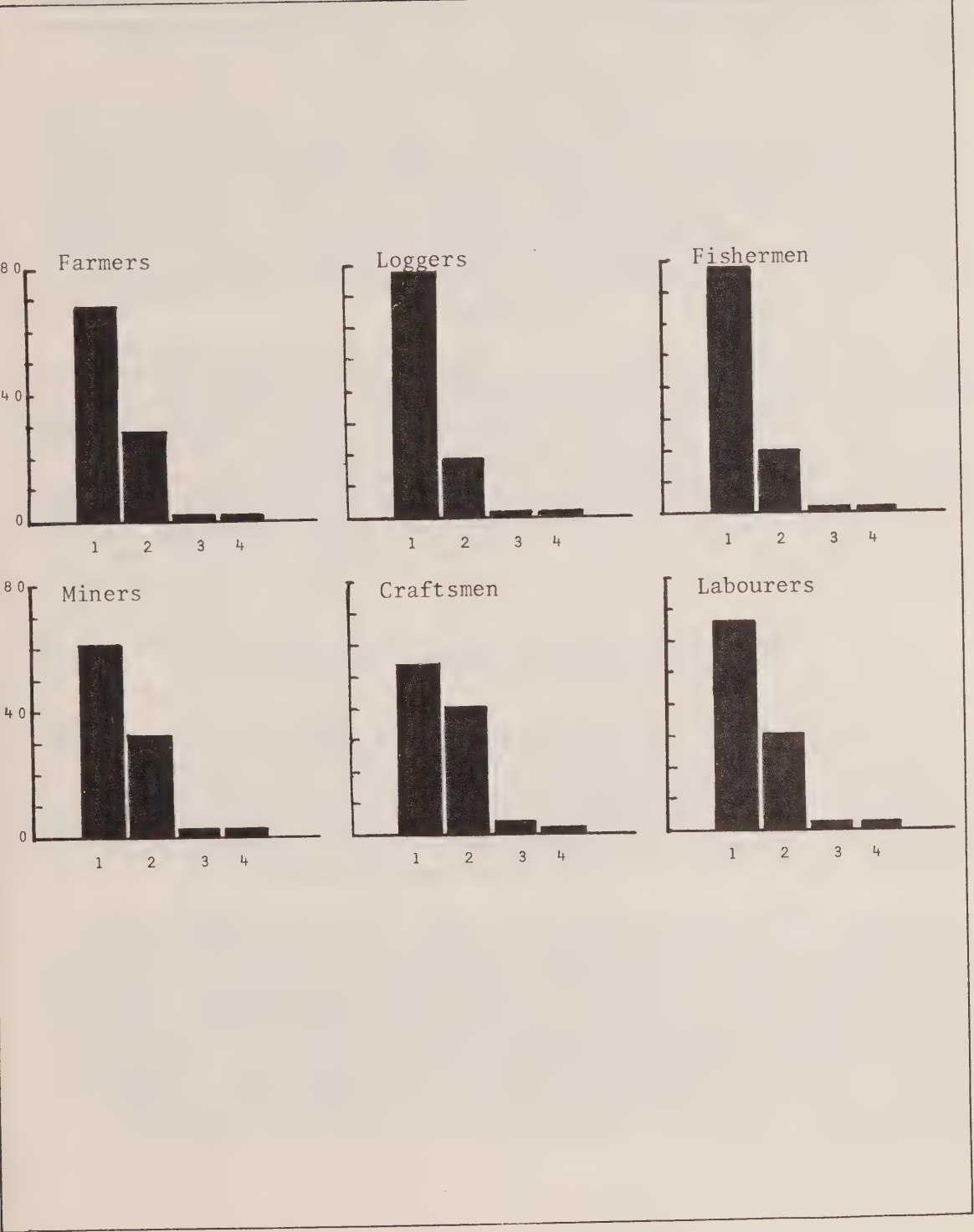
EDUCATIONAL STRUCTURE BY OCCUPATION



Source: N.M. Meltz's 'Manpower In Canada, 1931 to 1961', Department of Manpower and Immigration, Canada, 1969.

DIVISION, CANADA, 1961

Percentages



growth in total personal income was highest in Ontario, British Columbia, Alberta and Newfoundland; but because of differential rates of population growth, Saskatchewan, Quebec, Prince Edward Island and Newfoundland showed the highest growth in per capita terms.

Levels of personal income per capita have also differed substantially for the various regions. In 1962-64, personal income per capita averaged \$2,025 for Ontario and \$1,966 for British Columbia; for the other provinces, it ranged from \$1,750 for Alberta to \$1,009 for Newfoundland (25, page 101). These disparities in regional income per capita appear to have remained fairly constant for the past 40 years or so, and will thus have contributed significantly to regional differences in both the level and composition of final demand.

Regional disparities have been the subject of much recent discussion, and several attempts have been made to determine the reasons for such disparities. It has been suggested that differences in both the quality and quantity of human resources, in natural resources, in capital intensity, and so on, explain part of these disparities (25, pages 98-141); but it appears that even after consideration of measurable factors, there remains a substantial residual which can only be explained by the differences in the efficiency with which resources are used and combined (28, page 142).

VII. Some Important Regional Differences

In 1960-64, the ratio of employed persons to total population varied from a low of 27% in the Atlantic region to a high of 37% in Ontario (25, page 114). Part of the regional differences are attributable to differences in the age structures of the populations; for example, the ratio of the working-age (i.e. 15-64) population to total population was lowest in the Atlantic region and highest in Ontario.

Similarly, participation rates (the proportion of the population, aged 14 and over, in the labour force) have varied substantially from one region to the other. For 1960-64 participation rates were lowest in the Atlantic region and highest in Ontario. In the Atlantic region, the rates for males and females were 73% and 24% respectively; for Ontario, they were 82% and 33% respectively (25, page 11). The reasons for the differences in participation rates are complex, but it seems clear that they reflect to some degree the availability of employment opportunities: over the post-war period as a whole the unemployment

rate averaged 7.6% in the Atlantic region, but only 3.2% in Ontario (25, page 116).

Interregional differences in the educational levels of the labour force have also been large, and the Atlantic provinces once again show a disadvantage when compared with other provinces. For example, in 1961, 4.7% of the Ontario labour force had a university degree; in the Atlantic provinces, the corresponding figure varied from 1.7% in Newfoundland to 3.7% in Nova Scotia (25, page 118). Similarly, in 1961, expenditures per school child in the Atlantic provinces varied from \$141 in Newfoundland to \$209 in Nova Scotia; in Ontario it was \$335 (6, page 71).

Differences in capital stock and its utilization have probably been as striking as differences in labour stock and its utilization, but data on regional capital stock are not currently available. However, approximate indicators do suggest large differences: for example, for the period 1951-64 new investment per capita varied substantially between regions. For all investment, it was $2\frac{1}{2}$ times greater in Alberta, the highest province, than in Nova Scotia, the lowest province; for business investment alone, the ratio was 3 to 1 (25, page 121).

The structure of economic activity within a province has also varied from one region to the other. All regions appear to have contributed to the changing industrial structure noted for the Canadian economy as a whole: employment in the primary industries has become relatively less important while that in service-producing industries has increased rapidly. A recent study has further suggested that relative employment in slow-growth and fast-growth industries differs significantly from one region to the other (6, page 72). For example, in 1961 the proportion of the labour force in manufacturing industries in slow-growth (based on growth in 1959-65) industries was 80.9% in Newfoundland but only 26.2% in Ontario; in fast-growth industries, the figures were 12.2% and 35.2% respectively (6, page 73).

It is clear from Table 3.3 that the primary industries provide a very substantial part of employment in both the Atlantic and Prairie provinces. Agricultural employment is particularly large in both economies, though fishing and trapping is also important in the Atlantic region. In Alberta, mining employment is quite low despite the high dependence of the economy on petroleum and natural gas mining: this reflects the high capital intensity of these industries.

TABLE 3.3

EMPLOYMENT DISTRIBUTION FOR PROVINCES BY INDUSTRY, 1961

	Percentages					
	Agri- culture	Total Primary (a)	Manufac- turing	Total Secondary (b)	Services (c)	All Industries
Newfoundland	1.5	17.9	10.9	18.3	63.8	100.0
Prince Edward Island	27.3	33.9	8.8	14.9	51.2	100.0
Nova Scotia	5.2	14.4	14.2	20.4	65.2	100.0
New Brunswick	7.2	15.2	16.0	21.8	63.0	100.0
Quebec	7.6	11.3	26.5	33.2	55.5	100.0
Ontario	7.2	9.7	26.9	33.0	57.3	100.0
Manitoba	17.6	19.9	13.6	19.4	60.7	100.0
Saskatchewan	37.0	38.9	4.6	9.7	51.4	100.0
Alberta	21.5	25.7	8.5	15.9	58.4	100.0
British Columbia	4.1	9.8	19.5	25.4	64.8	100.0
CANADA	10.2	14.0	21.7	28.0	58.0	100.0

- (a) Primary: Agriculture, Forestry, Fishing and Trapping, Mining, Quarrying, Oil Wells
- (b) Secondary: Manufacturing, Construction
- (c) Services: All other industries.

Source: Economic Council of Canada, Second Annual Review, page 124.

TABLE 3.4

DISTRIBUTION OF LABOUR FORCE BY OCCUPATION DIVISION FOR REGIONS, 1961

Division	Percentages				
	Atlantic	Quebec	Ontario	Prairie	British Columbia
Managerial	8.0	7.9	8.9	8.0	10.1
Professional & Technical	9.4	10.3	10.1	9.1	10.0
Clerical	10.2	12.6	15.2	11.2	13.0
Sales	6.4	6.0	6.8	6.1	7.5
Service & Recreation	11.0	10.4	10.9	10.1	11.7
Transportation & Communication	7.4	6.5	5.8	5.5	6.7
Farmers	6.8	7.6	7.3	25.0	4.3
Loggers	3.5	1.8	0.5	0.4	2.2
Fishermen	4.0	0.2	0.1	0.3	0.9
Miners	2.0	0.7	1.1	0.9	0.9
Craftsmen	21.5	27.3	25.9	16.6	23.9
Labourers	7.2	5.8	5.2	4.4	5.8
Occupations Not Stated	2.6	2.9	2.2	2.4	3.0
All Occupations	100.0	100.0	100.0	100.0	100.0

Source: Based on census data for 1961.

The figures in Table 3.3 tend to understate the importance of the primary industries since firms which are engaged in the processing of the primary products are classified in the manufacturing sector. Thus, in the Atlantic provinces a substantial proportion of employment in the manufacturing sector is provided by the fish processing and canning and wood products and paper industries. Similarly, part of the labour force in the manufacturing sector in the Prairie provinces is employed in the production of by-products from the mining sector. In British Columbia, wood products and paper industries provide a large part of employment in the manufacturing sector.

The different structures of industrial employment in the regions obviously generate different occupational distributions for the labour force in each region; these are given in Table 3.4 for 1961 for the occupation divisions. Here we note the relatively greater importance of the primary occupations in the Atlantic and Prairie regions: this is clearly associated with the importance of the primary industries. In the Prairie region, craftsmen, production process and related workers form a much lower proportion than that in other regions because of the relatively lower importance of the secondary industries. It is also interesting to note that the variation between regions is relatively smaller for white collar occupations than for blue collar occupations: this reflects the similarity in the relative importance of service-producing industries in all regions.

VIII. Summary and Conclusions

This brief investigation of Canadian economic growth has broadly indicated how both demand and supply factors have been important in explaining past growth. On the demand side, changes in both the level and structure of output have been generated by changes in the level and composition of final demand. The pattern of personal consumption, which forms the largest component of final demand, has been changing in response to changing incomes and tastes; demand for exports has also been changing and the demand for manufactured goods has become relatively more important than in the past. Investment demand has become stronger partly as a result of increased mechanization, especially in the primary industries, but also partly in response to more intense replacement cycles.

On the supply side, both the quality and quantity of the basic factors of production have been important determinants of growth.

Because of fundamental shifts in the pattern of consumption and technological developments, the relative importance of natural resources has declined somewhat though more so for some regions than for others. Capital input has clearly been important, but because of the availability of foreign funds, its supply has not had a limiting effect on growth. In contrast, the quality of the labour force has apparently limited the potential of the Canadian economy, and differences in educational attainments have contributed to regional disparities.

In making our projections to 1975, we are basically interested in medium-term developments and hence tend to ignore short-term and cyclical changes. It seems fairly reasonable to assume that past trends in final demand, and hence output, will continue. However, both the composition and level of final demand may be significantly altered by changes in demand in world markets, or by government policy. The Economic Council of Canada has made it clear that maintenance of the desired goals of low unemployment, a sound international position, and reasonable price stability requires improving use of both fiscal and monetary policy and better planning of government expenditures (24, pages 185-205). Similarly, efforts by the various governments to reduce regional disparities may appreciably alter the regional structure of demand and output.

Projections of labour productivity are even more difficult to make: increases in efficiency, technological developments, and improvements in the quality of the labour force are all necessary for the maintenance of high productivity growth. Kendrick's detailed study of growth of labour productivity are significantly different for different time periods: the differences are particularly striking for productivity in individual industry sectors.

In making projections of regional employment by industry, the range of alternative possibilities increases partly because of the generally smaller base and hence the relatively greater effects of changes in demand or government policy. This is particularly true for employment in the primary industries: in the Atlantic provinces because of the high dependence of the fishing industry on export markets; in Quebec and Ontario because of mechanization in forestry and new discoveries and developments in mining; in the Prairies because of the importance of world demand for wheat and because of United States' oil quotas and the uncertainty of the oil deposits on the Alaskan North Slope; in British Columbia because of the sensitivity of the important forestry industry to changes in construction activity.

It seems fairly clear that projections of employment by industry and region are subject to a high degree of uncertainty because of the rapidly changing structure of the Canadian economy, because of large regional disparities and because of spatial differences in new developments and discoveries. For this reason we decided to make two alternative projections for employment in each industry and region which appear to be reasonable in the light of both past growth and expected future developments. In this way we hope to indicate to some extent at least that in the medium-term there are alternative courses of developments which need to be fully identified in projections studies.

CHAPTER 4

MAKING THE MANPOWER REQUIREMENTS PROJECTIONS

I. Limitations of the Data

To reiterate, our projections of occupational requirements have been obtained by projecting (a) occupational employment as a proportion of total employment, (b) total employment per unit of output and (c) the level of output, of each industry. The last two steps were collapsed into one for making regional projections since estimates of output by industry and region are not currently available. Projections of the occupational structure of each industry were obtained at the national level using the occupation-industry data from the censuses of 1941, 1951 and 1961; regional projections were then derived by applying the national projections to the regional occupational structure of each industry in 1961.

Detailed occupation by industry statistics are available only in census years but these are not comparable from one year to the next because of changes in both the occupational and industrial classifications used. Our first task was therefore to convert existing census data to a common classification basis: the data were re-classified to the occupation and industrial classifications used in the 1961 census. The three-step projection procedure outlined above was chosen in an attempt to reduce the effects of these biases though it is important to note that clearly some error still exists.

It is also important to note that the converted census data for 1941, 1951 and 1961 represent three different points in the Canadian cycle and have different degrees of labour market disequilibria in each occupation, industry and region. The trends are therefore particularly difficult to identify.

Changes in the industrial classification have also introduced non-comparability in the historical estimates of output and employment by industry. However, indices of real domestic product have recently been published on the basis of the 1960 Standard Industrial Classification and these are available for a long period of time (18). In contrast, estimates of employment by industry are only available on the basis of the 1960 Standard Industrial Classification for the period since 1961.

For Canada, gross domestic product by industry of origin is expressed at factor cost and since this excludes indirect taxes less subsidies, each industry is therefore placed on a comparable valuation basis. Real domestic product is obtained by subtracting intermediate inputs from gross output, both valued in constant dollars. Indices are then derived for aggregate industry groups using a base-weighted Laspeyres quantity index.

The indices of real domestic product suffer from conceptual and measurement problems, and there are many gaps and inconsistencies in the data used in their construction (17, pages 57-64). Their usefulness in economic analysis is therefore somewhat limited, and this is particularly important for productivity analyses. One of the more important limitations concerns the indices for public administration and other non-commercial service-producing industries. Here output cannot be measured in the usual terms of product market value and a simple measure of labour input valued at base period wage rates is used instead: there is therefore an implicit assumption that the productivity ratio is unity. A detailed discussion of the concepts and methods used in the calculation of the indices can be found in a recent publication by the Dominion Bureau of Statistics (17).

Estimates of employment by industry are currently available from two main sources, the Labour Force Survey (12) and the Employment Survey (16). The Labour Force Survey is a household survey which covers roughly 1% of the total population. The Employment Survey is a survey of establishments and is therefore more suitable for industry analyses; it covers all establishments with 15 or more employees, and about 10% of known establishments with less than 15 employees. Its coverage thus varies widely for different industries: it is virtually complete for industries with mainly large establishments, for example in railway transport, but relatively low in others, for example in truck transport. Moreover, the Employment Survey includes only paid workers and excludes employees in agriculture, fishing and trapping and some non-commercial service-producing industries.

The Labour Force Survey and Employment Survey differ in other important respects (20, pages 11-13), for example in the treatment of employees absent from work without pay, and we therefore expect that there will be some difference between the two series. Estimates of paid workers in the total commercial economy, excluding agriculture and fishing and trapping, have recently been compared on a monthly basis for the period 1961-68; this indicates that the Labour Force Survey estimates are higher than the Employment Survey estimates. A previous comparison using annual averages for the period 1947-63 showed not only the same pattern from about 1953, but also that the difference tended to increase over time (19, pages 38-46). Various attempts have been made to reconcile the differences between the two series, but there still remains "a gap of 177,000 (which may well be explained by)..... the difference in the survey periods, the factors not yet quantified or, indeed, factors not recognized including the different techniques used to compile the two series" (20, page 16). However until further research has been completed, we must recognize that the errors in both series may be substantial.

The estimates of total employment by industry used in this study are based mainly on estimates from the Employment Survey. Estimates from the Labour Force Survey have however been used to fill in the gaps in the Employment Survey: in providing estimates of other-than-paid workers in all industries, and of total employment in agriculture, fishing and trapping, and public administration.

Our choice of employment estimates will clearly have an important effect on our total employment projections and hence on our projections of occupational requirements. Thus if we had used a different employment series we would have obtained different, probably very different, projections. This point cannot be over-emphasized and it means that the projected numbers of persons required in each occupation can provide no more than a rough indication of manpower requirements.

The employment estimates obtained as outlined above were available on the basis of the 1960 Standard Industrial Classification for the period since 1961. This gave only seven annual observations which we felt was rather too short a series for making projections over the eight-year period to 1975. The problem of the comparability of the data over time is further complicated by the fact that before 1961 the Employment Survey covered only establishments employing 15 or more persons so that the coverage was substantially worse at that time (14).

Employment estimates by industry from the Employment Survey on a monthly basis for the period 1961-64 have been graphically compared for (a) establishments employing 15 or more persons, classified on the basis of the 1948 Standard Industrial Classification and (b) all establishments, classified on the basis of the 1960 Standard Industrial Classification (15, pages 11-13). The differences between the two series appear to be mainly due to seasonal factors; the all-establishments series fluctuates more than the larger-establishments series. The trends over time appear to be roughly the same and this suggests that approximate estimates of employment by industry may be obtained on the basis of the 1960 Standard Industrial Classification by using the trends in the comparable industries in the 1948 Standard Industrial Classification. We emphasize that this rough and ready procedure is not really suitable for all purposes and in making our projections, especially those of productivity, we have tended to give more weight to the observations for the period 1961-67.

We have tried in the previous few pages to illustrate some of the important errors which exist in the basic data with which we have had to work. Errors exist in both the estimates of output and employment: as we have mentioned before, we feel that they are large enough to invalidate the use of regression analysis. The projections we have arrived at are therefore subject to a great deal of error, and they will probably need to be revised substantially when better data become available. This must constantly be borne in mind in the discussion and assessment of the results presented here.

II. Employment Projections

We have made our projections for 1975 on the assumption that the economy will be operating close to its potential in that year. In other words, we assume that the demand conditions will be such that the economy can, and will, make full and efficient use of its available economic resources. In making our projections we have therefore tended to give more weight to the observations for 1956 and 1966 since in those years the economy appeared to be operating near its existing potential: (24, page 49; 28, page 182), the unemployment rates were 3.4% and 3.6% in 1956 and 1966 respectively but these are slightly higher than the potential unemployment rate of 3% estimated by the Economic Council of Canada (24, page 38).

Most of the analysis is presented in index form (1966 = 100): rates of growth for the period 1966-75 were thus easily calculated and these roughly represent our assumptions about the potential growth of the economy. These have been compared, where possible, with observed rates of growth for the period 1956-66.

For Canada, projections of employment by industry were derived using projections of output and labour productivity. We first measured the latter in terms of output per man-hour and this meant that we also had to make projections of average hours worked by industry. The use of output per man as a measure of productivity to by-pass this difficult problem did not yield appreciably different results.

The output-productivity approach could not be used for all industries since output per man-hour and output per man have little real meaning in some industries: in public administration because of the implicit assumption of unit productivity in estimating output, and in agriculture and fishing and trapping because of effects of weather and other vagaries of nature. In these industries, employment was projected by the simple extrapolation of past trends.

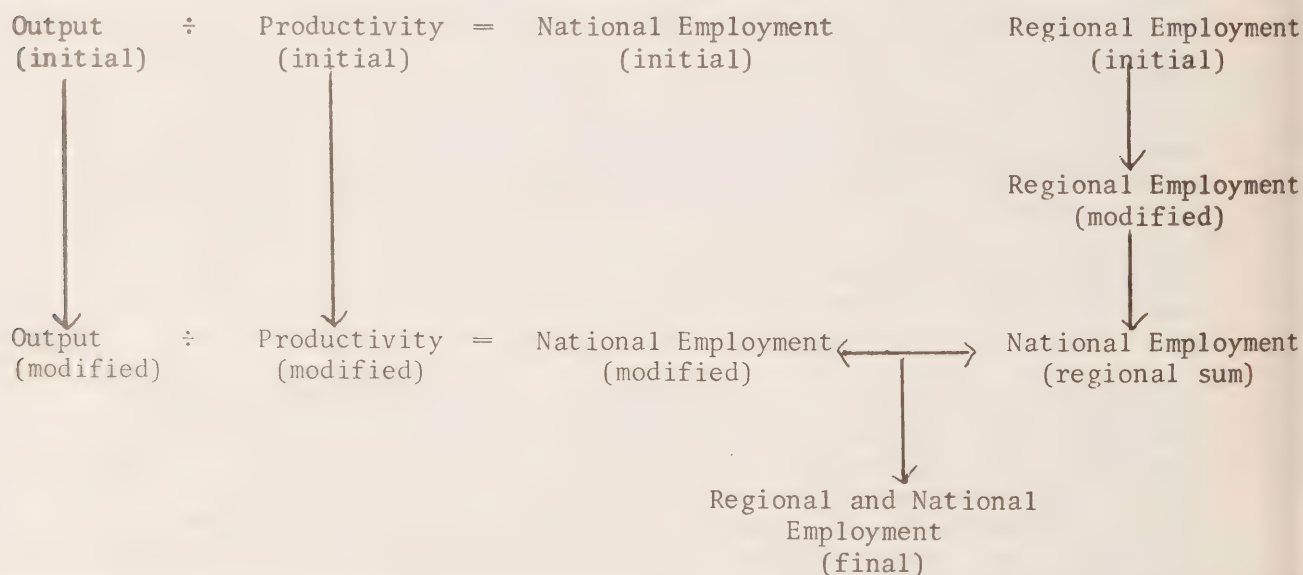
The initial projections of output, labour productivity and employment by industry were circulated for criticism and comment to knowledgeable and interested persons in universities, industry and federal and provincial government departments. Most of the recipients did, in fact, scrutinize the projections and their comments were generally favourable. We did however receive a few important criticisms and suggestions and we modified our initial projections to take account of them.

At the regional level, initial projections of employment by industry were obtained by direct extrapolation of past trends. This was not completely satisfactory because of large irregular fluctuations in some of the employment series. These projections were therefore subject to much more careful scrutiny than the national projections and several people in each region were interviewed to provide more varied insight into future economic developments. The initial regional projections were then modified to take account of the views expressed.

In the last stage of the analysis, the employment projections for Canada were compared with the sum of the regional projections. In most cases the differences were small and the sum of the regional projections gave a projection for Canada which was consistent with both

past trends and expected developments over the next few years. However, in some industries, notably agriculture, the two projections were appreciably different, and some further discussion was undertaken before we arrived at our final projections.

The following diagram may help to illustrate more clearly the various steps taken in arriving at our final projections. At each stage of the analysis the projections were assessed and modified to take account of opinions about expected developments. However, we felt that the presentation in this report would have been unnecessarily complicated if we had included all of our various projections and we have limited the presentation to our final projections. We have also used the modified output projections with the final employment projections to derive the implied assumptions about productivity changes: these do not, in fact, differ markedly from the modified productivity projections.



It may be interesting, however, for the reader to have some indication of the extent of the total modifications made; for this reason, the initial and final employment projections for Canada are compared in Table 4.1.

As was noted in the preceding chapter in our brief description of the Canadian economy, the high sensitivity of regional employment by industry

TABLE 4.1

PROJECTED EMPLOYMENT BY INDUSTRY, CANADA, 1975

		Thousands	
		Final Projections	
		Alt. 1	Alt. 2
Agriculture	419.2	430.0	372.7
Forestry	78.0	73.3	61.0
Fishing and Trapping	18.5	24.4	16.8
Mining, Quarrying, Oilwells	130.1	155.4	133.4
Manufacturing	1,998.6	2,000.8	1,889.0
Construction	497.9	479.0	539.7
Transportation, Storage and Communication	656.0	627.8	681.3
Public Utilities	86.1	85.6	81.5
Trade	1,418.5	1,353.0	1,416.5
Finance, Insurance, Real Estate	394.7	368.8	388.3
Service	2,646.4	2,630.0	2,736.3
Public Administration	502.8	598.0 (a)	598.0 (a)
All Industries	8,847.0	8,926.0	8,914.4

(a) Only one projection was made for public administration because of the difficulty in specifying a reasonable alternative.

to the changing structure of the economy prompted us to prepare two alternative projections of employment for each industry and region. This meant that we could derive 2^5 (i.e. 32) possible alternative projections for employment in each industry for Canada. The two alternatives shown were obtained by combining: (a) the higher and lower projections in each industry and region to give respectively a higher and lower projection in each industry for Canada; (b) for Canada, the higher projection in each of the goods-producing industries with the lower projection in each of the service-producing industries, and vice-versa.

It is clear that this procedure is fairly arbitrary and several equally logical ways of combining the projections may be suggested. Our method is however fairly simple and it does seem to provide national projections which indicate reasonable alternative courses of development and which also reflect some of the uncertainty about the effects of future economic developments. In addition, the projection of total employment is, in both cases, reasonably consistent with the projections of the labour force in 1975 made by the Economic Council of Canada (35). The population projections used by the Council in arriving at labour force projections have recently been revised upwards by the Dominion Bureau of Statistics on the basis of the population census of 1966 (31). When these changes are taken into account, the projected growth of employment (labour force less 3%, the Council's target unemployment rate) is 30.2% for 1966-75. The corresponding figures from our projections are 27.9%, 29.1% and 28.9% for the initial projections, and alternatives 1 and 2 of the final projections, respectively. Note that comparison is only approximate and cannot be made in terms of absolute numbers since the Council's projections are based on data from the Labour Force Survey only and hence the data are quite different from ours. The differences are, however, of roughly the same magnitude as the differences in the two sets of estimates for 1967.

III. National Employment Projections

Indices of real domestic product (1966 = 100) have been plotted on a logarithmic scale in Figure 4.1 for the period 1953-67; data for finance (for simplicity, industries will be referred to in abbreviated form) and public administration were available only for the period 1961-67. Our projections for 1975 have also been included in the graphs. In several cases, there are fairly marked trends during the observation

period and it seemed reasonable to assume a continuation of past trends. In agriculture and fishing, however, output fluctuates widely because of the effects of weather and other vagaries of nature, and our projections here may not be very reliable. However, the Economic Council of Canada has projected an annual rate of growth of 0.9% per annum in agricultural output over the period 1963-70 (27, page 86): over the same period our projections imply a growth rate of 0.8% and thus compare well with the Economic Council of Canada's projections.

In the output series for the other industries the fluctuations in growth rates during the period often represent special circumstances. In mining, the rapid growth before 1957 reflects to some degree the effects of low values of output in the early fifties. In manufacturing, much of the recent increase in output has been due to the increasing utilization of the substantial over-capacity that existed in the early sixties (28, page 184). The variations in construction activity are mainly due to the complex pattern of adjustment to business cycle fluctuations.

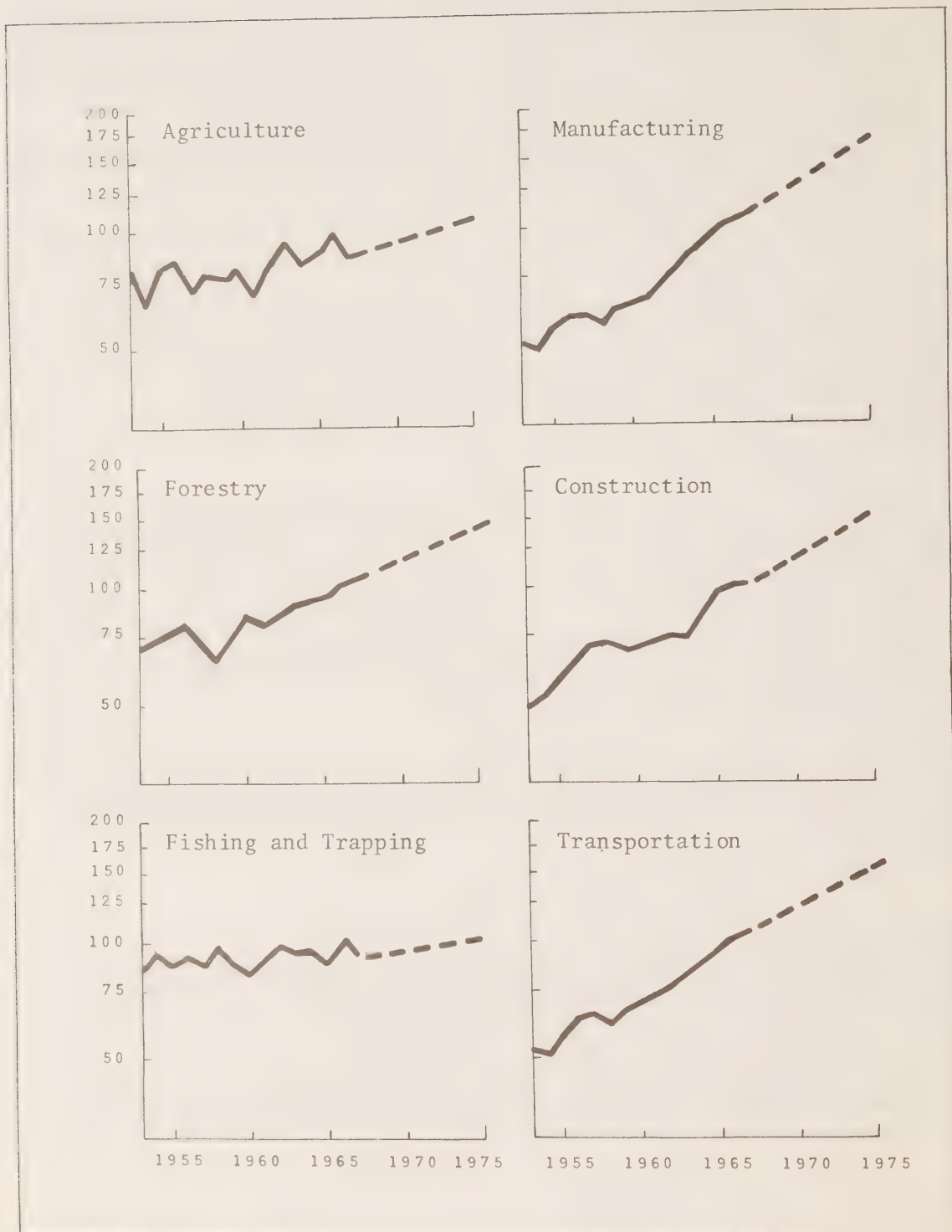
Our projection of total Gross Domestic Product has been compared (in constant 1961 dollars) with a projection of Gross National Product made by the Economic Council of Canada (27, page 86). The Council's projected growth rate for the period 1965-75 is 4.9% per annum and this compares with our rate of 4.8% per annum for the same period. The comparison is approximate: since Gross Domestic Product and Gross National Product differ, for example in that the former excludes interest and dividends, etc. accruing to Canadian owners of foreign assets, the rates will tend to differ slightly.

In Figure 4.2 we have plotted indices of output per man for ten of the twelve industries. As we noted earlier, the projections for 1975 have been derived using our final employment and output projections. We therefore show two alternatives which correspond to the alternative employment projections.

It should be noted here that we might equally well have used one productivity projection and two output projections. However, it appears that continuation of the recent high rates of productivity growth is less likely than maintenance of high rates of growth of output so that two productivity projections seemed more sensible.

The range in the projections is relatively large for the primary industries thus reflecting the existing uncertainty about development in those industries. In agriculture, the maintenance of high produc-

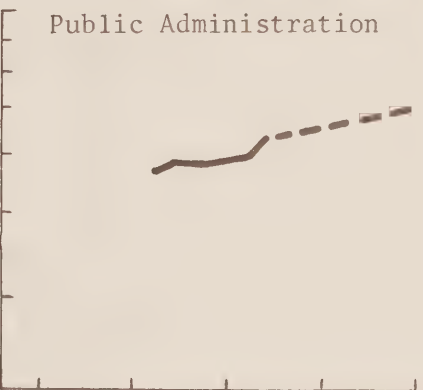
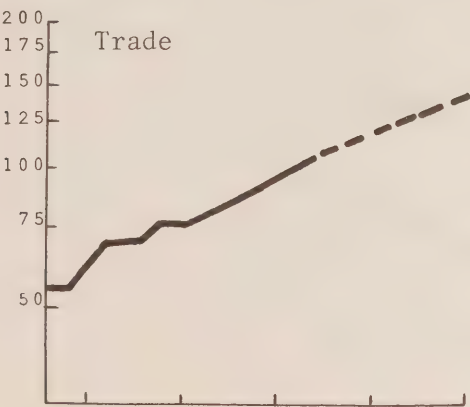
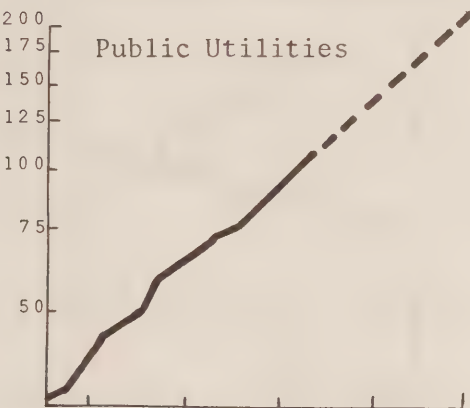
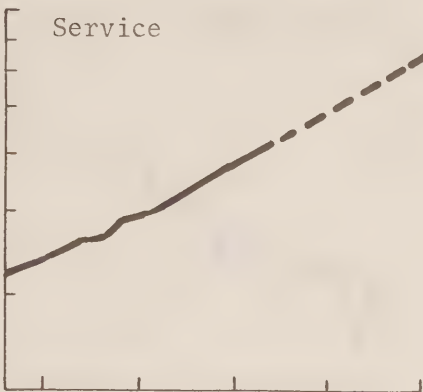
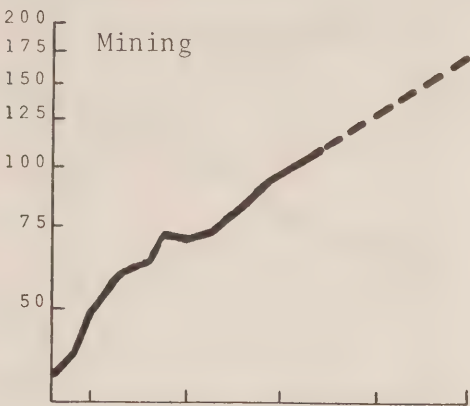
INDICES OF REAL DOMESTIC



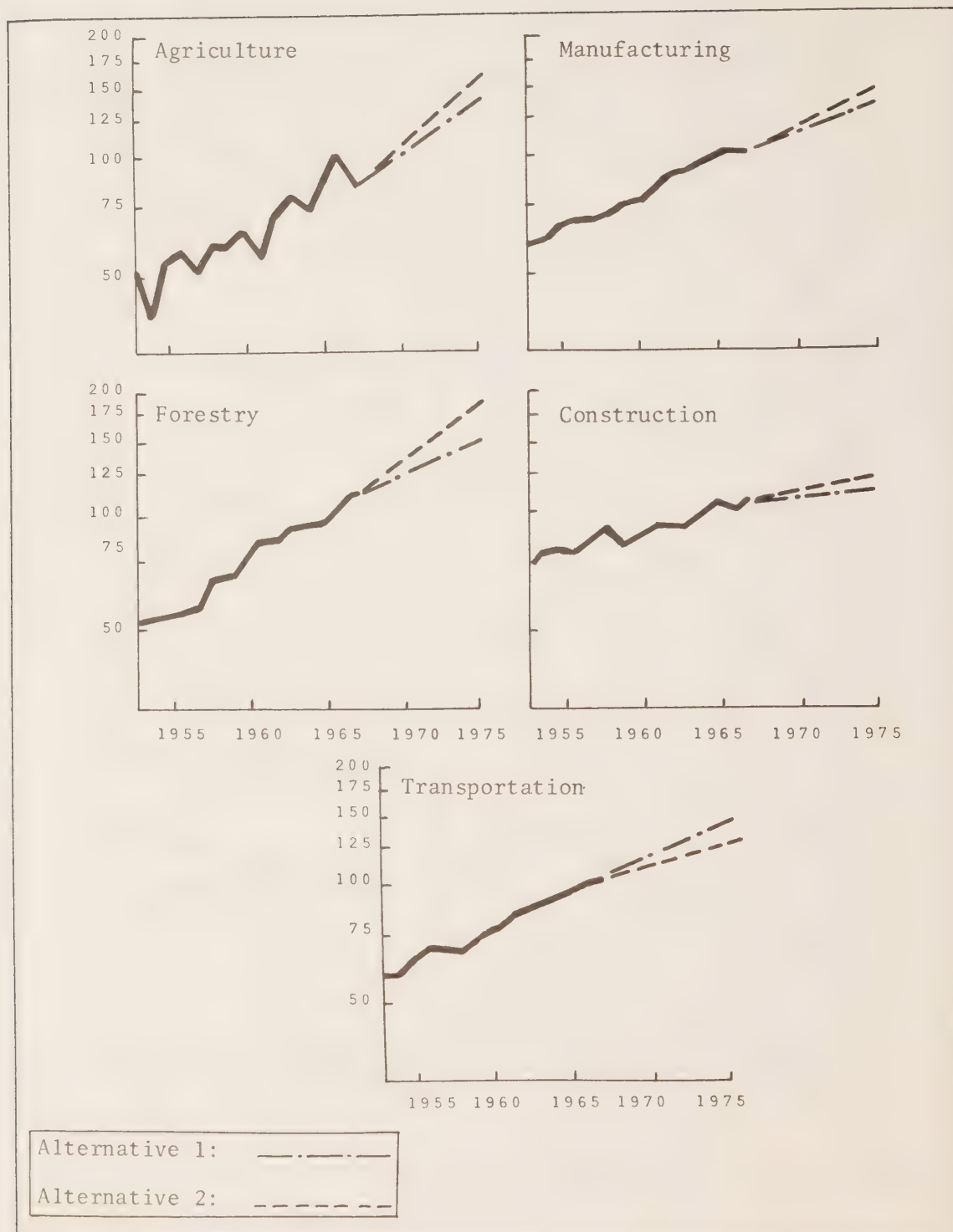
Note: 1966 = 100

Indices plotted on logarithmic scale.

PRODUCT BY INDUSTRY

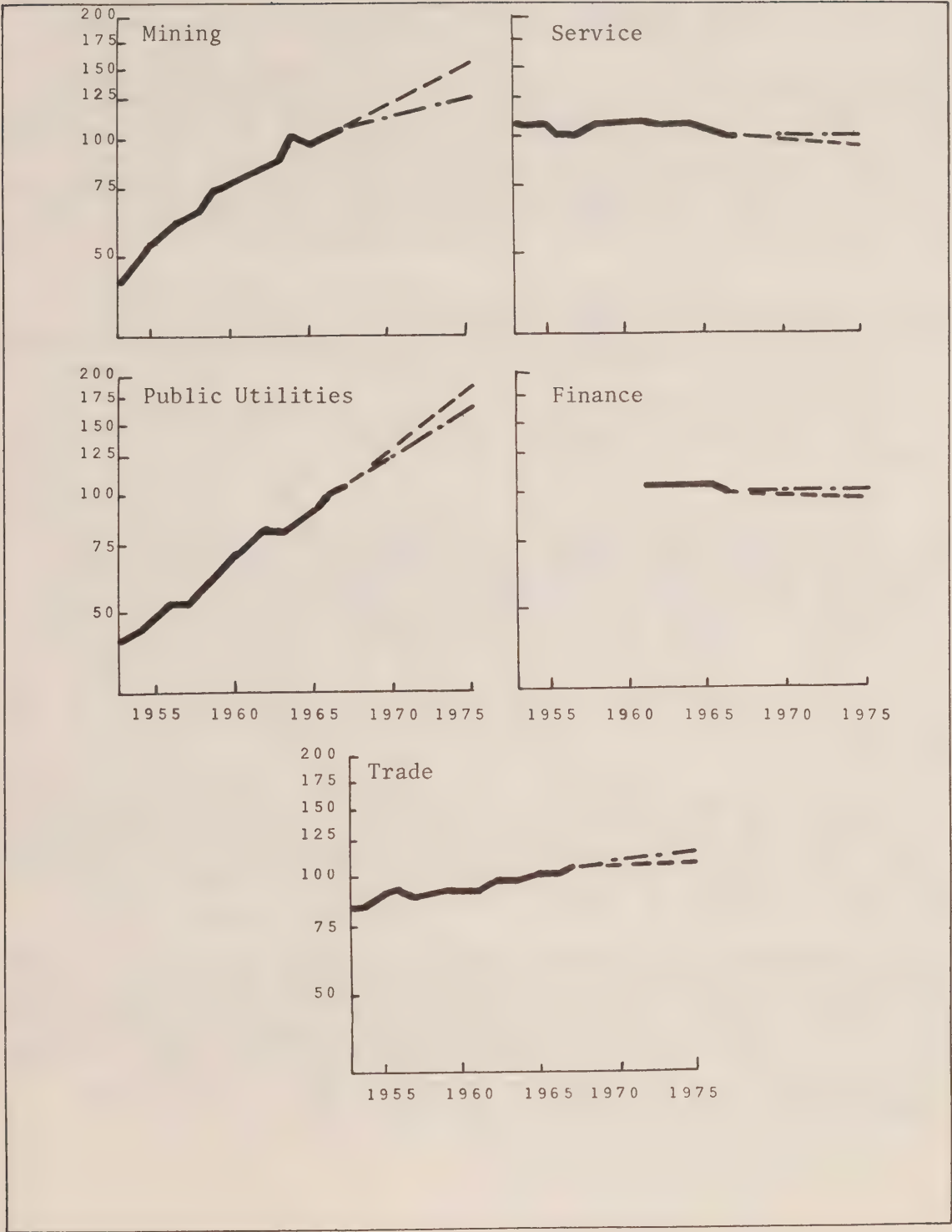


INDICES OF REAL DOMESTIC



Note: 1966 = 100
Indices plotted on logarithmic scale.

PRODUCT PER MAN



tivity growth seems to depend on the rationalisation and reorganisation of farms and on the continuation of the population drift to the urban centres. In forestry, gains in productivity have been taking place as a result of mechanisation and large declines in both hours worked and employment; at the same time the period of operations has been lengthened. It thus appears that productivity gains have been associated with a number of special factors which may not continue in the future. Diversification of mining operations and new discoveries and operations in the more labour-intensive sectors may lead to a slackening of the rate of productivity growth for the industry as a whole.

In other industries, there is also uncertainty about technological developments and their effect on productivity. For example, the increasing use of pre-fabricated materials may shift employment to the manufacturing sector, thus increasing productivity in construction. Similarly, the widespread use of containers in freight transport may well lead to significant changes in productivity in the transportation sector.

Indices of employment have been plotted in Figure 4.3 for each industry and we have again included our alternative projections for 1975. Both alternatives appear to fit in reasonably well with past trends, though the effect of the uncertainty in the primary industries, and especially in fishing, is once again noticeable. It should be noted however that although the relative differences in the two alternatives are smaller for the secondary and tertiary industries, these often represent a larger number of people. Thus the absolute difference in fishing and trapping is only 8 thousand, but in manufacturing it is 110 thousand.

In all the primary industries, except mining, employment is projected to decrease over the period to 1975, partly as a result of further increases in productivity associated with mechanisation and rationalisation. In mining, it appears that employment will increase because of new developments especially in Ontario and the Prairies.

For agriculture, the Economic Council of Canada has projected a rate of growth of -3.1% per annum in the period 1963-70 (27, page 86); our projections to 1975 imply rates of growth of -3.1% per annum and -3.9% per annum in the same period. Perkins has also made a projection of -2.3% per annum in the period 1966-76 (45): our growth rates of -2.7% per annum and -4.3% per annum for the period 1966-75 are therefore somewhat lower. However, our discussions in the region led us to

believe that, especially in the Prairie region, the high rate of decline in agricultural employment will continue throughout our projection period.

Employment in manufacturing is projected to continue expanding at the same rate as it did in the sixties and the same is expected in construction: in the case of the latter, our projection compares closely to that made by Upex (47). In transportation, the future is less certain and our lower projection assumes only a slight change in employment in the period 1966-75. In the other service-producing industries, however, employment is projected to continue growing at the high rates of the fifties and sixties.

We have calculated our projected rates of growth of output, output per man and employment and these are presented in Table 4.2. The table also includes the rates of growth observed in the period 1956-66.

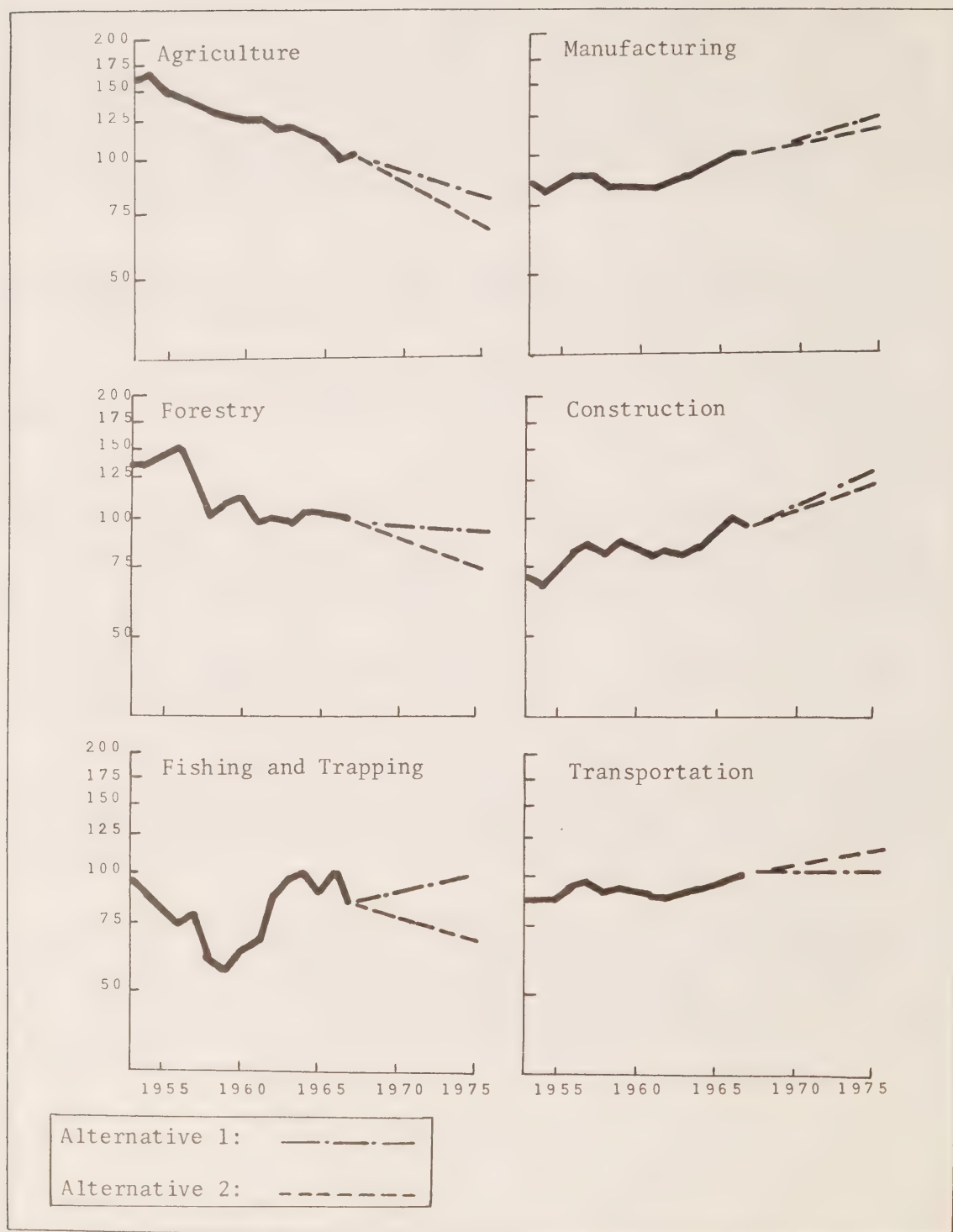
Once again we note the large discrepancies between the projected rates for the primary industries and the rates for 1956-66: these often reflect the influences of special factors, for example, the record wheat harvest in 1966.

The rates of growth of output, productivity and employment also vary substantially from one industry to the other. Output is projected to grow fastest in the secondary and tertiary sectors while productivity growth is expected to be greatest in the primary sector. Employment is projected to grow most rapidly in the service-producing industries.

The negative increases in output per man projected for finance and service may seem rather strange. However, the incidence of part-time work has been increasing rapidly as a result of increasing labour force participation rates for women. Since women tend to form a proportionately larger part of employment in the service-producing industries, and in finance and service in particular, the rate of decline in average hours-worked is much higher for the service-producing industries. Because of this rapid decline, output per man may tend to fall even if output per man-hour increases.

The employment projections by industry are presented graphically in a different way in Figure 4.4. Here we have plotted the share that various industry groups form in total employment: we have again plotted the alternative projections for 1975 on the graph.

INDICES OF EMPLOYMENT



Note: 1966 = 100

Indices plotted on logarithmic scale.

BY INDUSTRY

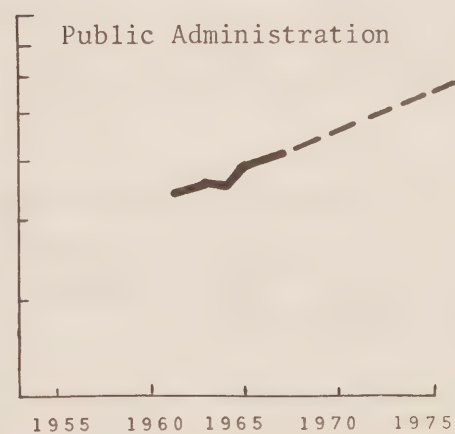
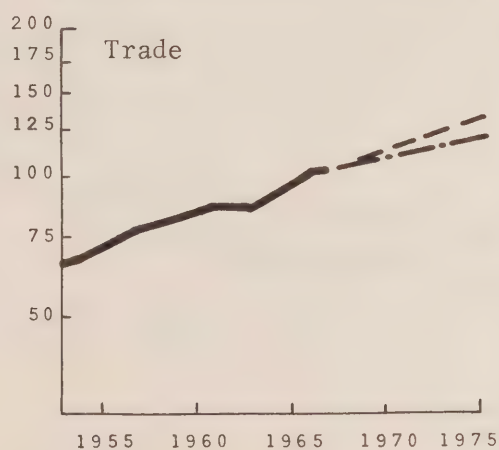
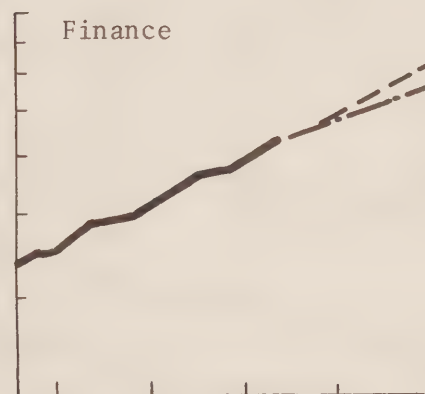
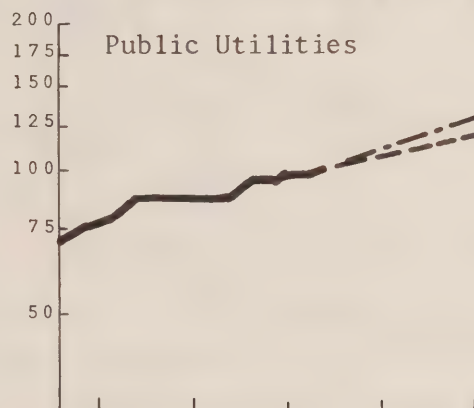
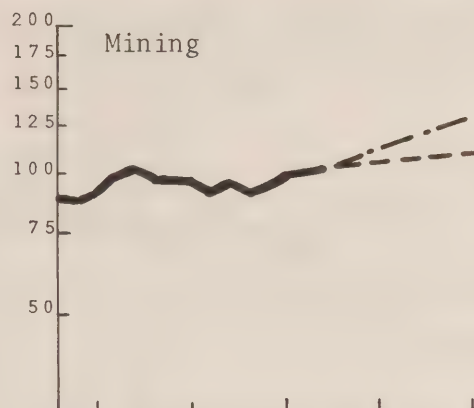


TABLE 4.2

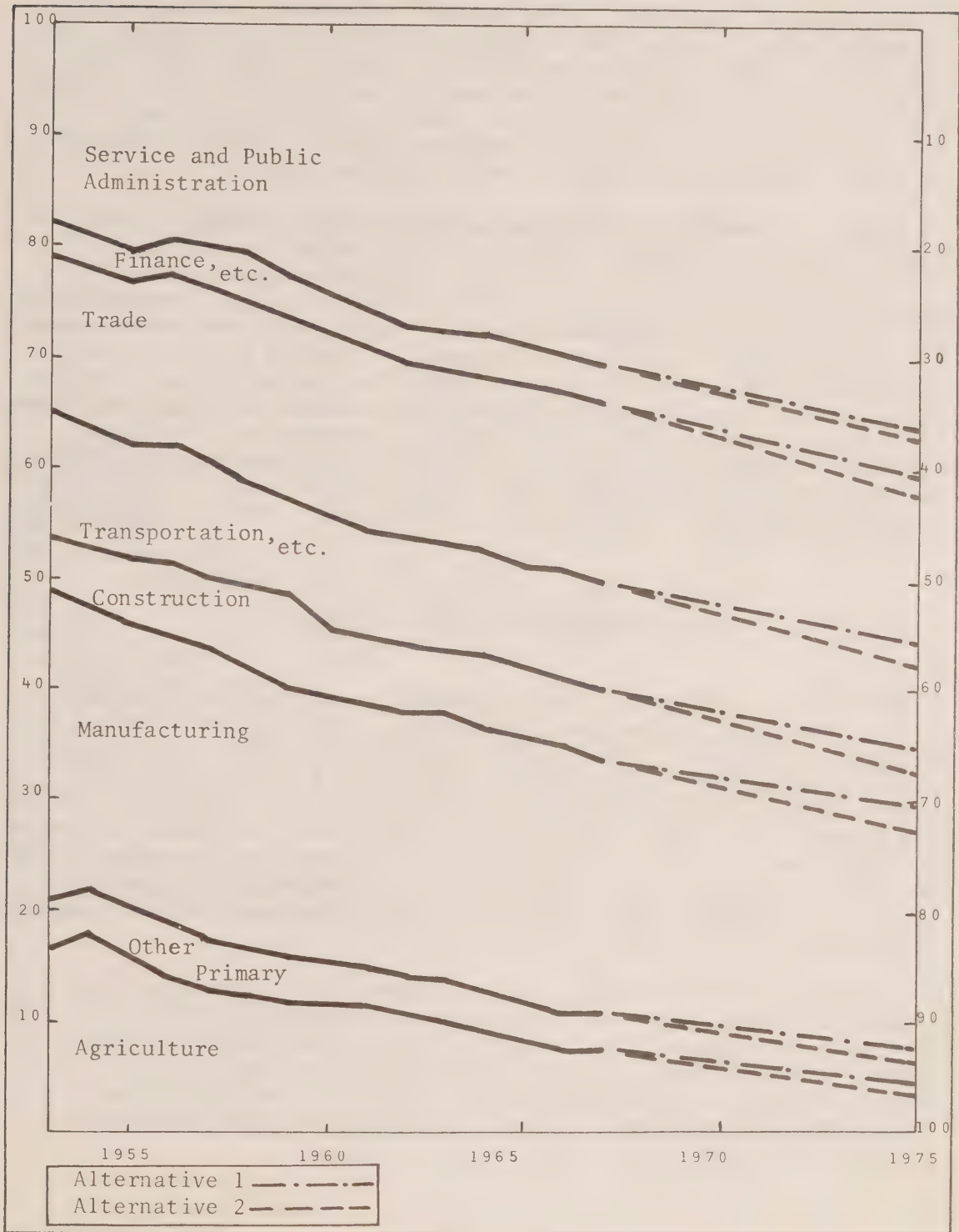
ANNUAL AVERAGE RATES OF GROWTH IN OUTPUT, PRODUCTIVITY AND
EMPLOYMENT 1956-66 (OBSERVED) AND 1966-75 (PROJECTED)

	Percentage rates of growth							
	Output		Output per Man			Employment		
	1956-66	1966-75	1956-66	1966-75		1956-66	1966-75	
				Alt. 1	Alt. 2		Alt. 1	Alt. 2
Agriculture	1.8	0.8	5.6	3.4	5.1	-3.7	-2.7	-4.3
Forestry	2.2	3.8	6.2	4.8	7.0	-3.9	-0.9	-3.0
Fishing	0.9	0.2	-2.1	-	-	2.9	0.1	-4.1
Mining	5.9	6.1	5.6	2.9	4.6	0.2	3.1	1.4
Manufacturing	5.3	5.5	3.9	3.3	4.0	1.4	2.1	1.5
Construction	4.4	4.5	2.2	1.2	2.0	2.1	3.2	2.4
Transportation	4.6	4.5	3.8	3.9	3.0	0.7	0.5	1.4
Public Utilities	8.6	8.8	6.5	5.8	6.3	2.0	2.8	2.3
Trade	3.8	3.8	0.8	1.4	0.8	3.0	2.5	3.0
Finance	-	3.9	-	0.0	-0.6	4.1	3.9	4.5
Service	4.9	5.2	0.1	-0.3	-0.8	4.8	5.5	6.0
Public Administration	-	2.3	-	-	-	-	4.0	4.0
All Industries	4.3	4.7	2.0	1.8	1.8	2.3	2.9	2.9

Note. - = not available or not meaningful.

FIGURE 4.4

DISTRIBUTION OF EMPLOYMENT BY INDUSTRY GROUP



The share of employment in the primary industries, and especially in agriculture, is projected to continue the fairly rapid decline in the post-war years. In manufacturing the share is projected to fall slightly but it is expected to increase in construction. The service-producing industries are all, except transportation, projected to increase their shares in total employment: here the largest increase is projected for the service-public administration group.

Figures on employment share are also presented in Table 4.3 and the trends noted above for the various industry groups are once again fairly apparent. The share for the service-producing industries as a whole (i.e. all industries except the primary industries, manufacturing and construction) is projected to grow to 66.3% under the assumptions of alternative 2. It may well be argued that such a high level of employment in the service-producing industries cannot be sustained by the economy. In such a case, the projected changes in output will have to be met by raising labour productivity, for example, by reducing disguised unemployment or by the re-allocation of manpower within the service-producing industries. This will be particularly true if the demand for manpower increases relatively rapidly in the goods-producing industries.

IV. Regional Employment Projections

The regional projections of employment by industry were more difficult to make than the national projections. The employment series for each industry generally show wider fluctuations at the regional level than at the national level partly because of the smaller base, and partly because of the relatively greater effects of sampling and coverage errors in estimating employment. In addition, employment estimates were not available for all industries and regions for the entire period: in public administration, we had only one observation (1967) from the Labour Force Survey, and this was used with 1961 census data to provide our projections for 1975.

For the other industries, initial projections were obtained in several different ways. We first projected employment in each industry by direct extrapolation of the past trend; we then projected each industry's share of total regional employment and compared this with the share implied by the employment projections. We also tried to relate regional employment in each industry to national employment in

TABLE 4.3

DISTRIBUTION OF EMPLOYMENT BY INDUSTRY GROUP

	Percentages			
	1956	1966	1975 ^(a)	1975 ^(b)
Agriculture	14.2	7.9	4.8	4.2
Other Primary ^(c)	4.5	3.2	2.8	2.4
Manufacturing	26.2	24.0	22.4	21.2
Construction	6.4	6.3	6.5	6.1
Transportation and Utilities	11.1	9.6	8.0	8.6
Trade	14.7	15.7	15.2	15.9
Finance	3.2	3.8	4.1	4.4
Service and Public Administration	19.6	29.5	36.2	37.4
All Industries	100.0	100.0	100.0	100.0

(a) Alternative projection 1.

(b) Alternative projection 2.

(c) Forestry, fishing and mining.

that industry, and we extrapolated the ratio of regional employment to national employment for each industry; we also examined scatter diagrams of regional employment and national employment for each industry.

The initial projections obtained by the various methods were then compared. Generally the results were roughly the same except that there were large discrepancies in the primary industries: these probably arose because of the wide fluctuations in our series of annual observations. Some discrepancies also existed in a few of the projections for manufacturing, trade and service but they were usually no more than 10 or 20 per cent.

Our discussions in the regions generally confirmed our views about the uncertain growth of employment in the primary industries. Since we had no data on regional output, we could not investigate the effects of alternative assumptions about productivity growth on employment as we had done at the national level. We therefore had to quantify the effects of expected changes on employment in a fairly subjective way using all the qualitative information we acquired in the region.

In Table 4.4 we have tabulated the observed rates of growth of employment in each industry and region for the period 1956-66: growth rates have not been calculated for fishing in all regions because of the small numbers involved. We have also included our two projected rates of growth for each industry for the period 1966-75. In Figure 4.5 we have plotted for illustrative purposes our observations of employment together with our projections for 1975 in some industries and regions.

Once again we note that the rapid decline in employment is expected to continue in all the primary industries except mining. The decline in agriculture is particularly striking in the Atlantic region; this more or less represents a continuation of the more rapid decline observed in the period 1959-67 than in the earlier period 1953-59. The bulk of farm income in the Atlantic region comes from field crops (mainly potatoes), dairy products and livestock, and more than half of Atlantic farms are still below the estimated minimum economic size for these products (3). It is expected that consolidation into larger units will continue and perhaps even accelerate as a result of government programs. In addition, the 1966 census results (21) indicate that 42.7% of total farm operators are 55 years of age or older: it seems unlikely that new entrants to the farms will be sufficient to fill the gap created by retirement of older workers.

In the other regions, the prospects for agriculture are much the same, and past trends are roughly expected to continue or even to accelerate. This is particularly true in the Prairie region because of the relative importance of wheat exports and the recent depressed state of world grain markets: it appears that wheat exports will decline substantially over the next few years.

Employment prospects in the forestry industry differ markedly across the country. In Eastern Canada, the industry is described as being on the verge of extensive mechanization and technological change, and hence employment is expected to decline rapidly. In contrast, new developments in both the Prairies and British Columbia are expected to generate increases in employment despite technological improvements: in the Prairies the rate of growth is particularly high for one of our projections but this reflects the low level of employment in the base year.

The fishing industry (which dominates the fishing and trapping sector) provides direct employment for only one or two thousand people in all the regions except the Atlantic. Our discussion in the Atlantic region revealed that there are very wide variations in the estimates of current employment in the fishing industry: differences obviously arise because of different definitions of full-time, part-time and occasional work (4, page 124; page 20), but the Dominion Bureau of Statistics estimates are probably low because of incomplete coverage in the Labour Force Survey.

Offshore fishing tends to be highly capital-intensive and both employment and investment have been increasing in recent years. In contrast, inshore fishing is more a one-man operation and employment has been declining here. Employment also depends on the state of world demand because of the importance of exports, and on variations in landing; in addition, the availability of employment opportunities in other sectors is important and employment in inshore fishing tends to rise as the unemployment rate rises. Making the satisfactory projections is therefore extremely difficult and we have tried to indicate the importance of this uncertainty by making the difference between our two projections fairly large.

Mining shows a marked difference from the other resource-based industries in that employment is projected to increase in all regions. In Ontario, our discussions indicate that mining operations of metallic minerals are constantly increasing; for example Elliot Lake appears to be starting a second boom despite stagnation in world uranium markets.

TABLE

ANNUAL AVERAGE RATES OF GROWTH OF

	ATLANTIC			QUEBEC		
	1956-66	1966-75		1956-66	1966-75	
		Alt. 1	Alt. 2		Alt. 1	Alt. 2
Agriculture	-4.4	-5.8	-9.8	-4.6	-3.4	-4.5
Forestry	-	-5.5	-6.8	-5.1	-3.4	-4.9
Fishing	3.2	0.9	-3.7	-1.4	-	-
Mining	-	1.8	0.8	1.6	1.8	0.7
Manufacturing	1.6	2.8	1.2	0.9	1.5	0.9
Construction	3.4	2.8	1.9	2.8	2.6	1.8
Transportation	-0.1	-0.1	0.5	1.1	0.5	1.6
Public Utilities	-	4.3	3.9	3.4	4.0	3.3
Trade	2.0	1.5	2.4	3.6	2.8	3.3
Finance	-	3.8	4.5	4.8	4.7	5.3
Service	-	4.3	5.4	6.9	6.0	6.5
Public Administration	-	1.7	1.7	-	5.8	5.8
All Industries	1.9(a)	2.0	2.0	3.1	3.0	3.2

Note.- = not available or not meaningful

(a) Based on Labour Force Survey data only.

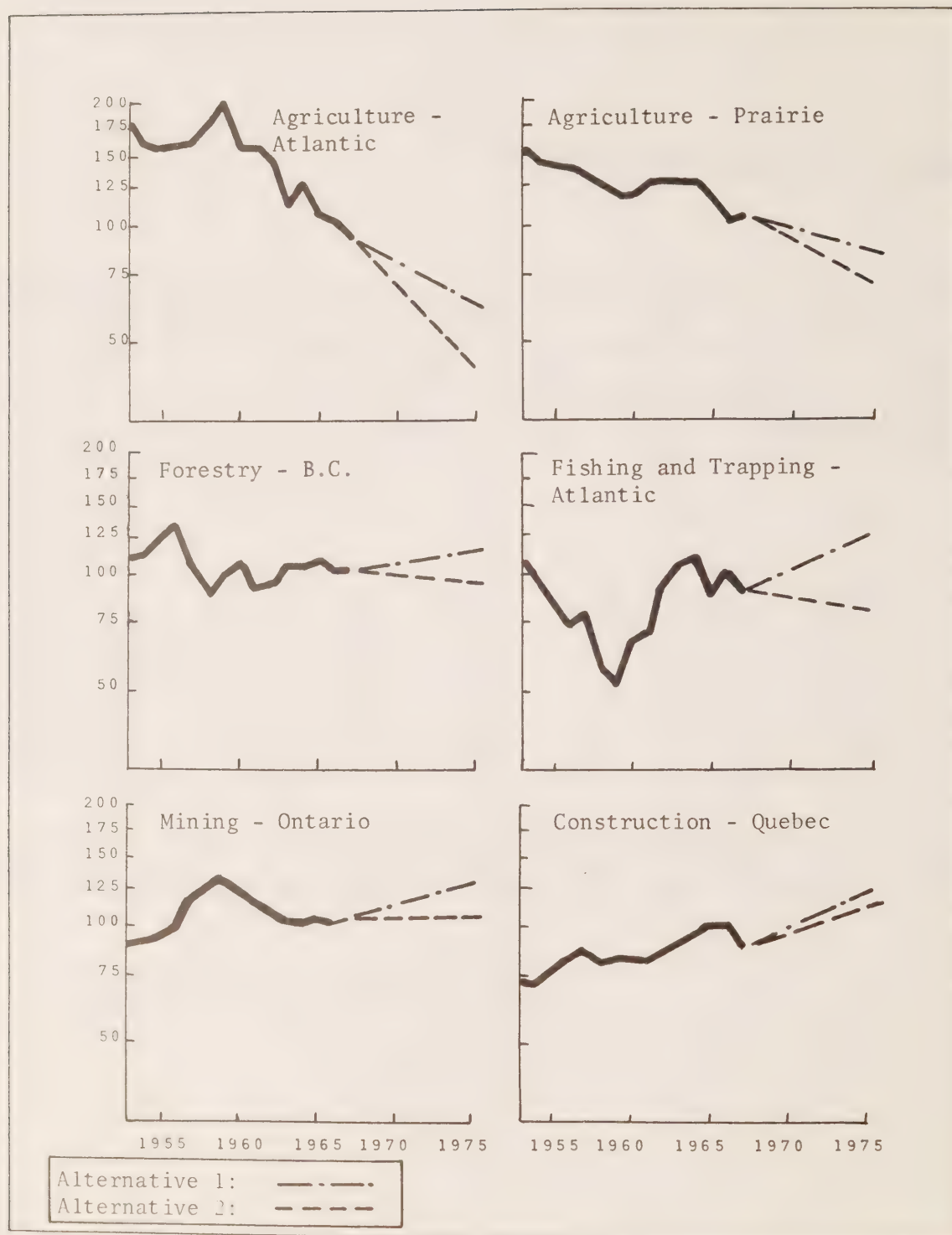
4.4

EMPLOYMENT BY INDUSTRY DIVISION BY REGION

Percentage rates of growth

ONTARIO			PRAIRIES			BRITISH COLUMBIA		
1956-66	1966-75		1956-66	1966-75		1956-66	1966-75	
	Alt. 1	Alt. 2		Alt. 1	Alt. 2		Alt. 1	Alt. 2
-4.3	-2.2	-3.5	-3.1	-2.4	-4.2	-0.1	-1.7	-3.1
-4.7	-1.1	-2.2	-	9.3	2.0	-2.8	1.1	-0.6
-	-	-	-	-	-	-	-	-
0.1	3.3	0.8	-	4.3	2.6	0.6	4.6	2.5
1.6	2.2	1.6	2.0	3.9	3.0	1.3	1.7	1.1
2.4	3.0	2.4	-0.2	4.9	3.6	2.5	2.7	1.9
0.8	0.6	1.3	-0.2	0.7	1.7	2.1	0.8	1.6
1.0	2.0	1.8	-	2.4	1.6	1.0	2.7	1.3
3.0	2.6	2.9	2.5	2.3	2.9	3.2	2.2	3.0
3.3	3.6	3.9	-	3.4	4.1	4.3	4.1	5.5
6.2	5.8	6.1	6.2	5.6	6.0	5.5	5.9	6.4
-	2.9	2.9	-	3.8	3.8	-	3.7	3.7
3.0(a)	3.0	2.9	2.4(a)	2.8	2.6	3.3(a)	3.1	3.3

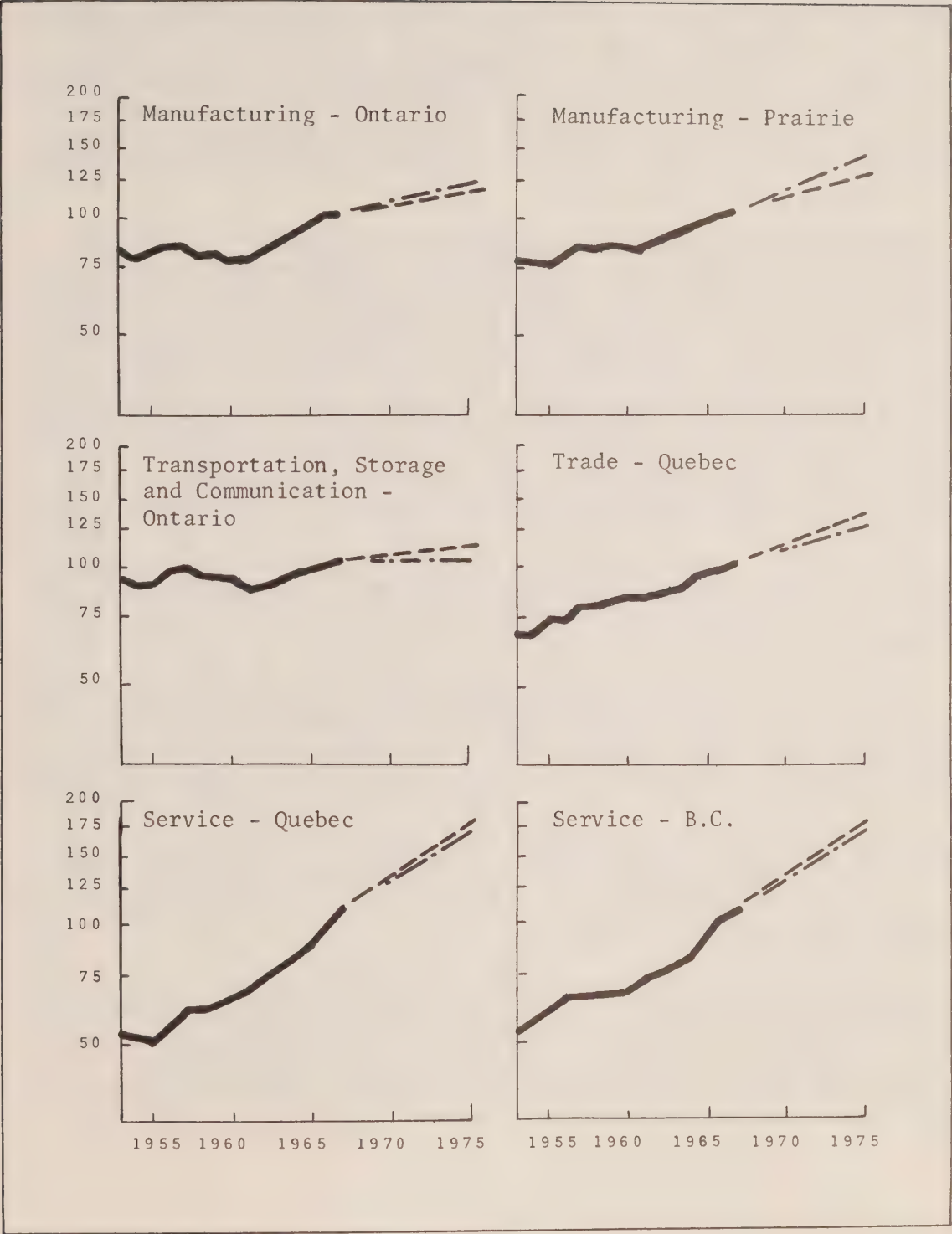
INDICES OF EMPLOYMENT BY REGION AND



Note: 1966 = 100

Indices plotted on logarithmic scale.

INDUSTRY 1953-67 AND 1975



Employment may therefore increase very rapidly as in our higher projection. Diversification in the Prairie mining industry, new discoveries of uranium, copper and silver, and expansion of potash and nickel are all expected to contribute to increased employment; but the oil industry suffers from uncertainty about the U.S. oil quota and the development of Alaskan North Slope oil deposits. Similarly, the opening up of new mines and increased exploration are expected to mean substantial increases in mining in British Columbia.

In the secondary and tertiary industries, employment is generally projected to increase, since the demand for consumer goods (especially durables) and services rises as income and population rise. In manufacturing, the Prairie region shows the highest rate of growth: this is partly due to the secondary effects of the expected developments in forestry and mining, for example in the wood products, and salt processing industries. In construction, the projected rate of growth in Quebec is slightly lower than the rate for 1956-66 to offset the disturbing influence of the construction boom associated with Expo '67. Transportation differs from the other service-producing industries in that there is some uncertainty about the effects of technological developments. The widespread use of containerization and unit trains in road and rail transportation and of computers in the communications field, may lead to substantial declines in total employment; but at the same time increasing demand may more than make up for the decline due to productivity changes.

The projections for the service-industries were rather difficult to make for British Columbia. Unlike the other regions, the employment series here show marked cyclical variations closely resembling those in the manufacturing sector: for example, the rate of growth of employment in the period 1961-66 was substantially higher than that in other periods. This similarity may be no more than mere coincidence but we feel that there may be good reasons to expect it: for example, it may well be that the general level of income, and hence, demand, is more closely tied to conditions in the manufacturing sector in British Columbia than elsewhere in Canada.

Our investigation showed that female participation rates also show similar cyclical variations in British Columbia, but again not for the rest of Canada. The variations may therefore be associated with the unique structure of the female labour force in British Columbia. Although the proportion of females in the service sector is much the same all over Canada, the structure differs in British Columbia in

several important respects. For example, in 1961 37.3% in British Columbia and 32.8% in Canada, of the females in the service sector were over 45 years of age; similarly, the proportion of single females in the service sector was 31.7% for British Columbia and 45.7% for Canada. Part-time employment was also relatively much more important in British Columbia: thus females who usually worked less than 20 hours per week formed, in 1961, 18.6% in British Columbia but 8.6% in Canada, of the labour force in the service sector.

Obviously these differences may not completely explain the observed cyclical variations; but we feel that they are sufficient to suggest that the similarity with the manufacturing cycle may be due to peculiarities in the structure of the female labour force in British Columbia and its sensitivity to general economic conditions. For this reason we treated the variations in employment in the service-producing industries as temporary fluctuations, and hence assumed lower rates of growth for 1966-75 than those for, say, the period 1961-66. These may therefore be underestimates of the potential growth in these sectors; even so, comparison with the rates of growth in the other regions show that the projected growth in British Columbia is higher than in the rest of Canada.

As we mentioned above, we made only one projection in public administration since we had only two observations for employment. The rate of growth in Quebec appears to be rather high, but we had no way of adjusting it downwards in a meaningful way. However, because of the fact that employment in public administration represents only about 15% of total employment, alternative growth assumptions will tend to change our final occupational requirements only slightly. This is particularly true since employment in this industry is spread fairly uniformly over all occupations.

Our employment projections for each industry and region are presented in Table 4.5 and in Table 4.6 we have calculated the share of total regional employment in each industry. The differences between the regions are quite striking. Agriculture is expected to be still relatively important in the Prairie region in 1975, and here manufacturing will still be relatively much less important than in other regions. The relative importance of trade is noticeably similar in all regions. The variation over regions in the relative importance of service is also smaller than that of manufacturing, and service employment is expected to represent between 1/2 and 1/3 of total regional employment in 1975.

TABLE

PROJECTED EMPLOYMENT BY INDUSTRY

	ATLANTIC		QUEBEC	
	Alternative			
	1	2	1	2
Agriculture	19.3	13.8	79.1	71.7
Forestry	9.6	8.6	18.5	16.2
Fishing	18.7	12.4	0.6	0.4
Mining	19.4	17.8	31.7	28.7
Manufacturing	98.0	89.9	589.6	558.6
Construction	50.3	46.5	147.1	137.6
Transportation	59.7	63.5	173.0	192.2
Public Utilities	8.6	8.3	21.7	20.4
Trade	97.8	106.4	370.9	389.9
Finance	17.5	18.5	112.2	118.4
Service	172.5	188.8	758.6	793.6
Public Administration	50.8	50.8	181.4	181.4
All Industries	622.2	625.3	2,484.4	2,509.1

4.5

DIVISION BY REGION, 1975

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA	
Projections					
1	2	1	2	1	2
115.5	102.7	194.1	165.0	22.0	19.5
12.6	11.4	10.0	5.4	22.6	19.4
0.9	0.7	2.0	1.5	2.2	1.8
45.5	36.6	44.0	37.9	14.8	12.4
999.3	946.6	163.9	151.0	150.0	142.9
212.7	202.4	113.7	102.0	55.2	51.2
198.8	212.8	121.3	132.8	75.0	80.0
32.3	31.7	15.0	14.0	8.0	7.1
525.2	537.3	230.0	243.9	129.1	139.0
153.0	157.3	51.0	54.5	35.1	39.6
979.9	107.4	438.5	453.9	280.5	292.6
208.0	208.0	102.3	102.3	55.5	55.5
3,483.7	3,454.9	1,485.8	1,464.2	850.0	861.0

PROJECTED EMPLOYMENT DISTRIBUTIONS

	ATLANTIC		QUEBEC	
	Alternative			
	1	2	1	2
Agriculture	3.1	2.2	3.2	2.8
Forestry	1.5	1.4	0.7	0.6
Fishing	3.0	2.0	0.0	0.0
Mining	3.1	2.8	1.3	1.1
Manufacturing	15.8	14.4	23.7	22.3
Construction	8.1	7.4	5.9	5.5
Transportation	9.6	10.2	7.0	7.7
Public Utilities	1.4	1.3	0.9	0.8
Trade	15.7	17.0	14.9	15.5
Finance	2.8	3.0	4.5	4.7
Service	27.7	30.2	30.5	31.6
Public Administration	8.2	8.1	7.3	7.2
All Industries	100.0	100.0	100.0	100.0

4.6

BY INDUSTRY DIVISION BY REGION, 1975

Percentages					
ONTARIO		PRAIRIES		BRITISH COLUMBIA	
Projections					
1	2	1	2	1	2
3.3	3.0	13.1	11.3	2.6	2.3
0.4	0.3	0.7	0.4	2.7	2.3
0.0	0.0	0.0	0.0	0.3	0.2
1.3	1.1	3.0	2.6	1.7	1.4
28.7	27.4	11.0	10.3	17.6	16.6
6.1	5.9	7.7	7.0	6.5	5.9
5.7	6.2	8.2	9.1	8.8	9.3
0.9	0.9	1.0	1.0	0.9	0.8
15.1	15.6	15.5	16.7	15.2	16.1
4.4	4.6	3.4	3.7	4.1	4.6
28.1	29.2	29.5	31.0	33.0	34.0
6.0	6.0	6.9	7.0	6.5	6.4
100.0	100.0	100.0	100.0	100.0	100.0

Projected changes in total employment have been calculated for the period 1966-75 (estimates for public administration in 1966 were obtained by interpolating the 1961 to 1967 change). These have been plotted in Figure 4.6 together with estimates for each region for the period 1953-67. Since our estimates for this period were incomplete, estimates from the Labour Force Survey only were used here; but although the rates of growth will differ slightly from those in our series, the graphs do in fact help to illustrate that our total employment projections are fairly well in line with past trends. The one exception is once again the graph for British Columbia where, as we pointed out above, we felt that the rapid increase in the period 1961-66 may be attributed to cyclical effects.

V. National Occupational Distributions

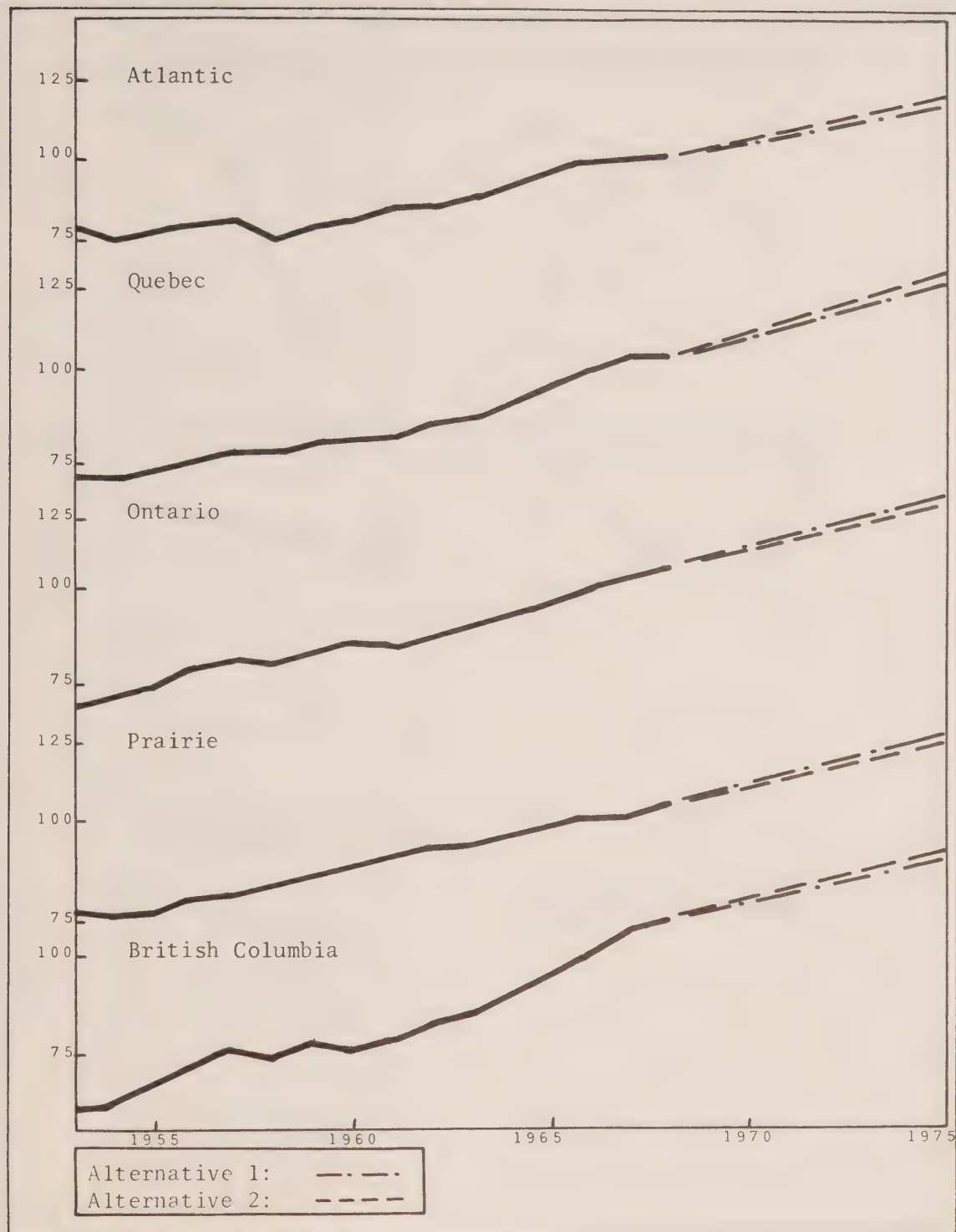
For Canada, projections of the occupational distribution of each industry (that is, the proportion that the labour force in a specified occupation and industry forms of the total labour force in that industry) were made by the simple extrapolation of the trend over the three census years 1941, 1951 and 1961. We first transformed the occupational distributions to index form and then plotted the three points on a logarithmic scale. The occupation-industry matrix we used is very large (approximately 2,500 cells) and we obviously could not draw a graph for every one of the cells. For this reason, we excluded all cells with less than 200-300 persons unless this was a large proportion of the total labour force in the specific occupation: in this way, we reduced the number of graphs to roughly 500.

A few of the graphs are shown in Figure 4.7 for illustrative purposes. It is clear that some of them show a remarkably linear trend over the three points, but others vary widely. In these cases it was extremely difficult to arrive at projections and we could often only make rough guesses. Of course, the projection in a given cell could not be made completely freely or independently of the projections in other cells in the same industry: since we were projecting proportions, the projections in all the mutually exclusive occupations in a given industry were obviously constrained to sum to one.

As we pointed out earlier, the occupational classification used in this study is based on that used in the 1961 census, and it has been designed to include all the occupation classes (e.g. dentists) that are

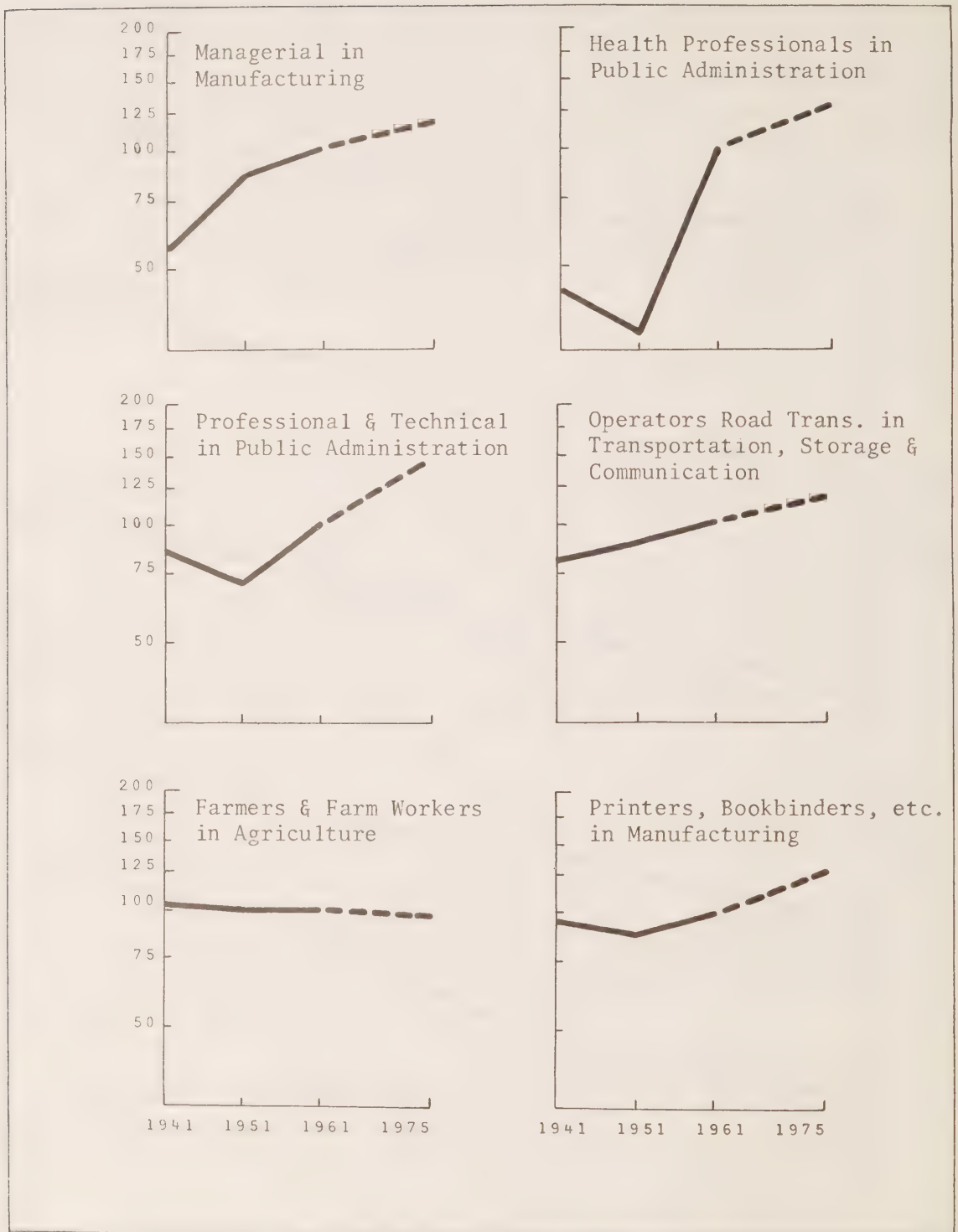
FIGURE 4.6

INDICES OF EMPLOYMENT BY REGION



Note: 1966 = 100

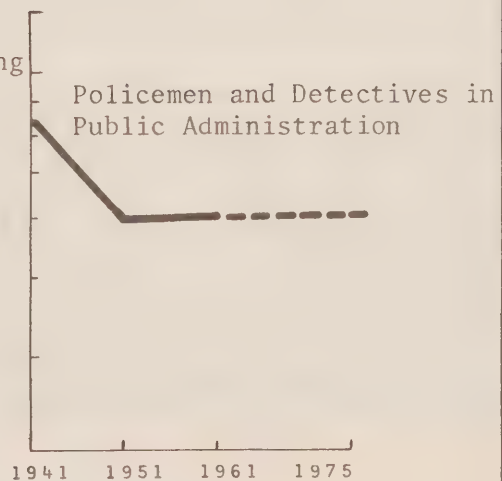
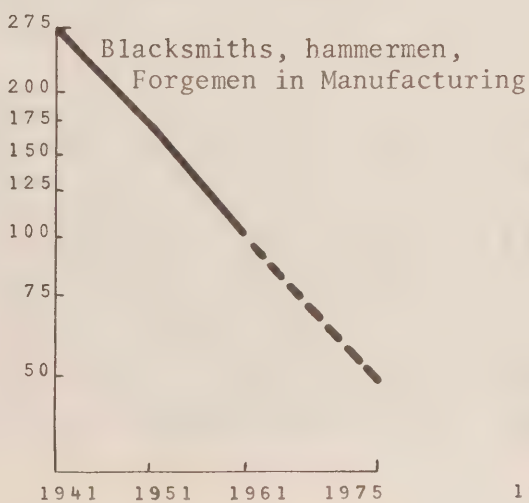
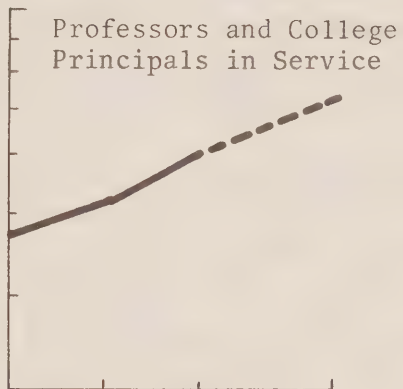
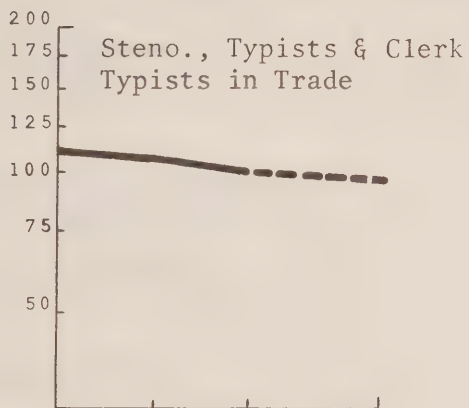
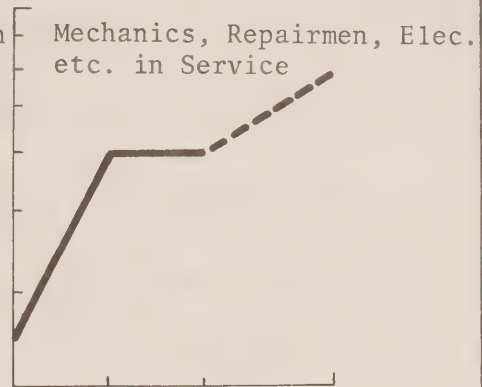
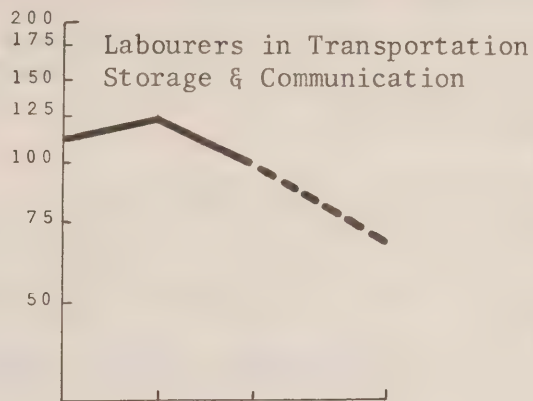
EXAMPLES OF THE SHARE OF AN OCCUPATION



Note: 1966 = 100

Occupational distribution plotted on logarithmic scale.

IN AN INDUSTRY DIVISION



comparable from one census to the other. These occupation classes have, in some places, been grouped with roughly similar classes to give occupation major groups (e.g. health professionals). Finally, the occupation major groups are grouped together to give occupation divisions (e.g. professional and technical occupations).

The occupation divisions (one of which is the total residual, i.e. occupation not stated), are mutually exclusive and so sum to the total in all occupations. Moreover, they have all been made comparable, though sometimes approximately so, for the three censuses. The occupation major groups, when they appear, are parts of the corresponding occupation division; thus the sum of the labour force in the occupation major groups equals the total for the corresponding occupation division. However, not all major groups could be made even roughly comparable in the various censuses so that for 1941 and 1951 the division total often exceeds the sum of the specified major groups. Finally, only the comparable occupation classes in each major group have been listed and an unspecified residual represents the difference between the major group total and the sum of the comparable classes.

An extract from the occupational classification may help to clarify the relationship between the three levels in the classification. In Table 4.7, we have shown two occupation divisions, and three occupation major groups. One of these major groups (biologists and agricultural professions) is not comparable over the censuses and thus the labour force in this occupation could not be determined for either 1941 or 1951. The classes specified are comparable but these do not necessarily add to the major group total: for example, in the major group, teachers, the class teachers and instructors not elsewhere specified is not comparable over the censuses and hence it is not listed even though it is part of the 1961 major group.

Because of the arrangement of the classification, we were able to make separate projections for the divisions, major groups, and classes. Thus we first made projections for the occupation divisions, and then for the major groups. Where all the major groups are comparable, the projection for the division could be compared directly with the sum of the projections for the corresponding major groups. Where the major groups are not all comparable, we combined the non-comparable ones to give a comparable residual major group for which we made a projection. For example, in the division professional and technical occupations, two major groups (biologists and agricultural professionals, and other professionals), are not comparable: these were combined to form a

TABLE 4.7

EXTRACT FROM OCCUPATIONAL CLASSIFICATION

<u>PROFESSIONAL AND TECHNICAL OCCUPATIONS</u>	Occupation division
BIOLOGISTS AND AGRICULTURAL PROFESSIONALS	Occupation major group
Veterinarians	Occupation class
TEACHERS	Occupation major group
Professors and College Principals	Occupation class
School Teachers	Occupation class
HEALTH PROFESSIONALS	Occupation major group
<u>CLERICAL OCCUPATIONS</u>	Occupation division

residual major group which represents the difference between the division and the comparable major groups. In this way we obtained figures for 1941 and 1951 so that a projection could be made for 1975. The sum of the projections in the comparable major group and the residual major group was then compared with the projection for the corresponding occupation division.

In a similar way, we defined a new residual occupation class, occupations unspecified, within each major group and figures for the residual were obtained for 1941 and 1951. We then made projections for all the comparable occupation classes and calculated a projected residual class by taking the sum of the projections for the comparable occupation classes from the projection for the major group. The projected residual was then compared with the past trend in the observed residuals.

In general, we found that when the projections at the three levels were compared the differences were relatively small, and hence we could make the necessary adjustments fairly easily. In some cases, however, the differences were large and we resolved these by careful re-examination of the graphs and adjustment on the basis of judgement.

The procedure of obtaining our final projections by comparison and adjustment of independent projections for the divisions, major groups and classes does in fact give us more confidence in the reliability of our projections. In addition it also ensures that the final projections in each industry are reasonably consistent with one another.

Two other practical points should be mentioned here. Obviously we could not make projections for the "occupation not stated" division and we had to assume that these people are distributed over all occupations in the same way as those who did state their occupations. However we distributed the "occupation not stated" division over all occupations only after we had made the projections: this thus gave us slightly more room for adjustment since we could make the "occupation not stated" division in 1975 only approximately the same as it was in 1961.

For completeness, projections have also been made for the non-comparable occupation major groups by assuming that the projected change is the same as the major group. This procedure gives a fairly good approximation since in many cases these classes together represent a large proportion of the major group total. A similar method was used in making projections for classes which were not strictly comparable

over 1941 and 1951 (e.g. mechanical engineers and industrial engineers separately).

VI. Regional Occupational Distributions

Since only one occupation-industry matrix was available for each region, that is for 1961, projections of the regional occupational distributions were obtained using the national projections. Thus we first calculated the projected changes over the period 1961-75 in the national occupational distribution for each industry; we then applied these projected changes to the corresponding occupation-industry cell in the 1961 regional occupational distributions.

The regional projections obtained in this way were subjected to the same type of scrutiny as the national projections. The sum of the projections for the occupation divisions was again constrained to one, and the projections for the divisions, major groups and classes were compared with one another for consistency checks. In general, we found that the differences and inconsistencies were small. For example, the total for the divisions was normally well within $\pm 2\%$ of one (i.e. 0.98 to 1.02) except in the primary industries: the worst case was in the mining industry where the sum equalled 1.14877, a discrepancy of 15%.

The large discrepancies were adjusted on the basis of judgement after examination of the relevant occupational distributions in 1961. For example, in the case of the mining industry in the Prairies, our examination revealed that the 1961 proportion of the mining industry labour force in professional and technical occupations (and miners, quarrymen and related workers) differed substantially for the Prairie region and Canada: the proportion was .16926 for the Prairies and .07997 for Canada. This is undoubtedly due to the relatively greater importance of oil and natural gas mining in the Prairies and hence the relatively higher requirements for technical and scientific manpower. It seemed unlikely that the high increase (73%) projected for Canada could be valid in the Prairies because of the higher proportion, and hence the large adjustments necessary in other occupations. In addition, it seems clear that the greater diversification in the Prairie mining industry will mean a rather low increase in the importance of professionals and technical manpower than might have occurred in the past.

In much the same way, we had to make adjustments to the distributions for other primary industries in all regions. Because of the high degree of judgement necessary and the arbitrariness of the actual adjustments made, we feel that the projections for the occupations associated with the primary industries, that is the primary occupations, will tend to be somewhat more sensitive than the others to changes in the assumptions upon which they are made.

CHAPTER 5

ASSESSMENT OF THE MANPOWER REQUIREMENTS PROJECTIONS

I. Sensitivity Analysis

Throughout this study we have repeatedly pointed out that the projections of occupational requirements are subject to many errors. We have emphasized that errors exist in the basic data because of problems of measurement: the estimates of real domestic product by industry tend to be unreliable because of conceptual and definitional problems; the employment estimates, based on samples of both households and firms, suffer from sampling and response errors as well as definitional ones. Even the census occupation-industry matrices are subject to many types of error: errors in response, coding, classification and, in the case of the data for 1941 and 1951, in conversion to the 1961 classification basis.

In addition, the projections are based on fairly specific assumptions about important variables, e.g. output and labour productivity; but implicit assumptions have also been made about other determinants of economic growth, e.g. consumption and investment. It is clear that alternative assumptions about future developments might easily have been made and these would have generated a different set of projections. Similarly, another set of projections would have been obtained if the data we used had been revised to eliminate some of the errors which currently exist in them.

It is important, therefore, that we should provide some indication of the range of alternative projections. This is done by examining the sensitivity of the projections both to errors and also to alternative assumptions arising at the various stages of the analysis. Thus we need to determine whether or not large errors in the basic data, or changes in the assumptions about the projections of output and labour

productivity will have much effect on the final projections of employment. The number of possible alternatives which we may investigate is large, but for simplicity we shall limit our examination to only two possibilities. We shall examine their effects on our employment projections, without specifying whether these possibilities arise because of data errors or alternative assumptions about the projections of output and labour productivity. Similarly, we shall investigate the effects of alternative projections of the occupational distributions of industries, again irrespective of how they arise.

The value of this type of sensitivity analysis is that it provides a greater understanding of the possible variability of the projections and hence an indication of their limitations. It also indicates those assumptions to which the projections are most sensitive so that attention can be concentrated on varying them in future studies. The analysis clearly needs to be designed to suit the particular uses to which the projections may be put, but these are too numerous for complete investigation. Here we have chosen to examine the sensitivity of the occupational projections in only four ways: for a given alternative industry employment projection or occupational distribution in a specified sector we calculate: (a) the absolute change in the manpower required in each occupation; (b) the proportional change in the manpower required in each occupation; (c) the absolute change in the projected total occupational distribution; (d) the proportional change in the projected total occupational distribution.

II. Theoretical Considerations

Let y_j denote employment in industry j and x_{ij} denote employment in occupation i and industry j as a proportion of employment in industry j . Then, manpower required in occupation i equals $\sum_j x_{ij} y_j = E_i$, and total employment (total manpower required) equals $\sum_j y_j = E$.

For manpower planning purposes, the occupational requirements, i.e. E_i , are of importance. These depend on the projected values of x_{ij} and y_j and we therefore seek to determine the effects of alternative values of x_{ij} and y_j on E_i .

(1) Assume first that we change a particular y_j , say y_k , by αy_k where α is a given factor. The change in E_i will be given by

$$\Delta E_i = \sum_{j \neq k} x_{ij} y_j + x_{ik} (y_k + \alpha y_k) - \sum_j x_{ij} y_j = \alpha x_{ik} y_k \quad (1a)$$

As a proportion of E_i , this is

$$\frac{\Delta E_i}{E_i} = \frac{\alpha x_{ik} y_k}{E_i} \quad (2a)$$

The change in the occupational distribution, $\frac{E_i}{E}$, can also be derived.

$$\begin{aligned} \Delta \left[\frac{E_i}{E} \right] &= \frac{E_i + \alpha x_{ik} y_k}{E + \alpha y_k} - \frac{E_i}{E} \\ &= \frac{\alpha x_{ik} y_k - \frac{E_i}{E} \alpha y_k}{E + \alpha y_k} \end{aligned} \quad (3a)$$

As a proportion of $\frac{E_i}{E}$, this is:

$$\begin{aligned} \frac{\Delta \left[\frac{E_i}{E} \right]}{\frac{E_i}{E}} &= \frac{\alpha x_{ik} y_k - \frac{E_i}{E} \alpha y_k}{\frac{E_i}{E} (E + \alpha y_k)} \\ &= \frac{\frac{\alpha x_{ik} y_k}{E_i} - \frac{\alpha y_k}{E}}{1 + \frac{\alpha y_k}{E}} \end{aligned}$$

$$= \frac{\frac{\Delta E_i}{E_i} - \frac{\alpha y_k}{E}}{1 + \frac{\alpha y_k}{E}} \quad (4a)$$

Equation (1a) tells us that the absolute change in the projected manpower required in occupation i depends on the absolute number in the corresponding cell in the occupation-industry matrix. In general, this means that the larger the industry and the occupation, the greater the sensitivity to changes. For example, a change of 10% in the employment projection in manufacturing will generate fairly large errors in the occupation divisions; but this will tend to be reduced for the occupation classes. Conversely, changes in the projections for a small sector, e.g. public utilities, will usually have only small effects on the occupational projections. This will not always be true however: changes in an occupation-specific industry, e.g. the primary industries, may generate considerable changes in corresponding occupations, i.e. primary occupations.

In terms of proportional changes, the occupational projections depend to a large degree on the variability of occupations over industries. The proportional change will be small for a specified occupation if the occupation is spread fairly evenly over all industries, but large if the occupation tends to be concentrated in one industry. Thus the change in the occupation divisions will usually be small, while it may be large for the occupation classes since these tend to be concentrated in particular industries. Once again the projection for primary occupations will be very sensitive to changes in the corresponding primary sector.

As is to be expected, the proportional change in the total occupational distribution (the manpower required in a particular occupation as a proportion of total employment) will be smaller than the proportional change in the occupational requirement. This difference will be larger for the more populous occupations than for the less populous ones, but it will tend to be relatively smaller for industry-specific occupations. For example, the difference will be large for changes in the service occupations; but it will be relatively less important for service occupations than for managerial occupations.

(2) Assume that we change two y_j 's: y_k to $(y_k + \alpha y_k)$ and y_1 to $(y_1 + \beta y_1)$. As before, we can derive four expressions for the change in the occupational requirements.

$$\Delta E_i = \alpha x_{ik} y_k + \beta x_{i1} y_1 \quad (1b)$$

$$\frac{\Delta E_i}{E_i} = \frac{\alpha x_{ik} y_k + \beta x_{i1} y_1}{E_i} \quad (2b)$$

$$\Delta \left[\frac{E_i}{E} \right] = \frac{(\alpha x_{ik} y_k + \beta x_{i1} y_1) - \frac{E_i}{E} (\alpha y_k + \beta y_1)}{E (\alpha y_k + \beta y_1)} \quad (3b)$$

$$\Delta \left[\frac{E_i}{E} \right] = \frac{\frac{\Delta E_i}{E_i} - \frac{\alpha y_k + \beta y_1}{E}}{1 + \frac{\alpha y_k + \beta y_1}{E}} \quad (4b)$$

These expressions are more complicated, but they add to our understanding of the effects of changes in y_j . If the changes in employment estimates in the two sectors are in the same direction, the changes in the occupational requirements will obviously increase. On the other hand, if the changes are in opposite directions, they will tend to compensate for each other, and the changes in the occupational requirements will decrease. In such a case, the changes in y_k and y_1 will tend to cancel each other if the numbers in the respective cells are equal except in the case where α and β are very different.

An interesting possibility is that the net change in the estimated employment in the two sectors exactly cancel each other (i.e. $\alpha y_k = -\beta y_1$) so that total employment remains constant. In this case, the change in E_i depends on the difference in the occupational structure of the two

sectors (i.e. $x_{ik} - x_{il}$). Since this is fairly large for most sectors, the change in the total occupational requirements will in fact seldom be zero. Once again, however, the effects will vary with the particular occupation: thus, compensating changes will make little difference for industry-specific occupations.

(3) Assume now that we change a particular x_{ij} , say x_{nk} , to $(x_{nk} + \gamma x_{nk})$. Note that this does not affect total employment E since $E = \sum_j y_j$.

As before:

$$\Delta E_n = \gamma x_{nk} y_k \quad (1c)$$

$$\frac{\Delta E_n}{E_n} = \frac{\gamma x_{nk} y_k}{E_n} \quad (2c)$$

$$\Delta \left[\frac{E_n}{E} \right] = \frac{\gamma x_{nk} y_k + E_n}{E} - \frac{E_n}{E} = \frac{\gamma x_{nk} y_k}{E} \quad (3c)$$

$$\frac{\Delta \left[\frac{E_n}{E} \right]}{\frac{E_n}{E}} = \frac{\gamma x_{nk} y_k}{E_n} \quad (4c)$$

Expressions (2c) and (4c) are identical and (1c) and (2c) have the same form as (1a) and (2a). The changes in E_i generated by a change in a given x_{ij} will therefore be of the same form as those generated by a change y_{ij} in a given y_j , and have already been discussed above.

(4) Finally assume that we change a given x_{ij} , say x_{nk} , to $(x_{nk} + \gamma x_{nk})$ and at the same time change a given y_j , say y_k , to

$(y_k + \alpha y_k)$. The latter change will obviously cause changes in all E_i as discussed above. Here we consider only changes in E_n .

The following expressions can be obtained:

$$\Delta E_n = x_{nk} y_k (\alpha + \gamma + \alpha \gamma) \quad (1d)$$

$$\frac{\Delta E_n}{E_n} = \frac{x_{nk} y_k (\alpha + \gamma + \alpha \gamma)}{E_n} \quad (2d)$$

$$\Delta \left[\frac{E_n}{E} \right] = \frac{x_{nk} y_k (\alpha + \gamma + \alpha \gamma) - \frac{E_n}{E} \alpha y_k}{E + \alpha y_k} \quad (3d)$$

$$\frac{\Delta \left[\frac{E_n}{E} \right]}{\frac{E_n}{E}} = \frac{\frac{\Delta E_n}{E_n} + \frac{\alpha y_k}{E}}{1 + \frac{\alpha y_k}{E}} \quad (4d)$$

The changes in E_n once again have the same form as those already discussed. If the changes in y_k and x_{nk} are in the same direction, the net effect on E_n will be greater than the sum of the individual changes. If they are in opposite directions, they will tend to compensate each other; however, because of the interaction term $(\alpha \gamma)$, the net effect will not be zero even if $\alpha = -\gamma$.

Now consider the restrictions which may be imposed on alternative projections for any specified y_j or x_{ij} . As we pointed out in the previous chapter, the projection of total employment can only make sense if it fits in with projections of the future supply of manpower. Total employment may therefore be constrained to approximate the projected

labour force less the unemployed. In this case a change in the employment projection in a specified sector must be compensated for by a roughly equivalent change in the opposite direction in at least one other sector. Thus if we change y_k by αy_k , we must change some other y_j by approximately αy_k if $\sum_j y_j$ is to be roughly constant.

In terms of our sensitivity analysis this means that changes in the employment projections in specific sectors will tend to have compensating effects on the occupational projections. The net effect on the occupational projections will tend to be small for occupations which are fairly evenly distributed over all industries; but it may be large for occupations which are concentrated in one industry.

Alternative projections of x_{ij} are similarly constrained since x_{ij} is a proportion and hence $0 < x_{ij} \leq 1$ and $\sum_i x_{ij} = 1$. If we change a given x_{ij} , say x_{nk} , by γx_{nk} , then at least one other x_{ik} must be changed by γx_{nk} . Thus for a given γ , greater adjustment will be required in the x_{ik} if x_{nk} is large than if x_{nk} is small. For example, if $\gamma = .20$, the absolute change in x_{nk} is .16 if $x_{nk} = .8$, but only .04 if $x_{nk} = .2$. This is intuitively obvious since a large percentage change is more reasonable for a small proportion than for a large proportion.

Since we assume that the occupational structure of any industry is independent of that of any other industry, a change in a given x_{ij} , say x_{nk} , need not be accompanied by compensating changes in any other x_{nj} . Thus, a change in x_{nk} could result in fairly large changes in E_n . In proportional terms, the change will be large if the occupation is concentrated in one industry but generally small if the occupation is evenly distributed over all industries. For this reason it is important to ensure that the range of alternative projections for x_{ij} is small and hence to make x_{ij} as large as possible: in other words, industries should be made as occupation-specific as possible.

This is in fact another advantage of using an input-output model for making projections: an input-output model deals with a large number of industries which due to disaggregation tend to be occupation-

specific. Thus the range of alternative projections for x_{ij} , tends to be limited, and attention may be concentrated on obtaining alternative occupational projections by changing the employment projection in each sector.

To summarize, our theoretical considerations suggest that the projections for those occupations which are uniformly distributed over industries and which form a large proportion of employment in each industry, will be least sensitive to alternative assumptions about the industrial structure of employment and the occupational distributions of the various industries. The sensitivity will tend to increase as occupations become industry-specific or less important as a proportion of total industry employment. If we let S_{ij} be the proportion that employment in occupation i and industry j forms of employment in occupation i , that is, $S_{ij} = x_{ij}y_j/E_i$, then the sensitivity will increase as S_{ij} tends to 1 and x_{ij} tends to 0. Occupations in which x_{ij} tends to 1 and S_{ij} tends to $1/12$ (as we use 12 industries) for all j will be least sensitive to alternative assumptions.

III. Empirical Results

The values of $1/S_{ij}$ have been calculated only for the alternative 1 employment by industry projections, and are given in Appendix Table III.

The tabulated values of $1/S_{ij}$ are rather more interesting than S_{ij} : as $S_{ij} = x_{ij}y_j/E_i$, $x_{ij}y_j/S_{ij} = E_i$, and thus $1/S_{ij}$ may be interpreted as the percentage change in $x_{ij}y_j$ necessary to generate 1% change in E_i . Thus $1/S_{ij}$ shows how much employment in the specified occupation and industry cell must be changed in order to change the occupational projection by 1%.

In the case in which a particular S_{ij} , say, S_{ik} , exactly equals 1, that is $x_{ik}y_k = E_i$, then the occupation is completely concentrated in one industry so that all other $S_{ij} = 0$ and $1/S_{ij} = \infty$. The x_{ij} are tabulated in Appendix Table V.

The figures in Appendix Tables III and V may be used to provide a guide to the sensitivity of any specified occupation by comparing $1/S_{ij}$ and x_{ij} for all industries. Those occupations in which any $1/S_{ij} \div 1$ and (1) the corresponding x_{ij} is small will be highly sensitive; for example, professors and college principals are completely concentrated in the service sector, ($1/S_{ik} = 1$, where k represents the service sector), and x_{ik} is rather small (1.145%). On the other hand, occupations in which all $1/S_{ij} \div 12$ and the corresponding x_{ij} 's are large will be fairly insensitive to alternative assumptions; the occupation division, clerical occupations, is one in which no $1/S_{ij}$ approaches 1 and in which the x_{ij} are large for the smaller $1/S_{ij}$ so that the projection is thus fairly insensitive.

This procedure is rather time-consuming and, to a certain extent, subjective, and it is obviously desirable to summarize the information in Appendix Tables III and V to provide a single index of sensitivity for each occupation. We found such an index difficult to derive although we experimented with several different methods; cross-multiplication of x_{ij} and the corresponding $1/S_{ij}$ seemed the most sensible method, but this reduces to E_i/y_j , which depends only on the marginal totals of the occupation-industry matrix and is therefore independent of the internal distributions.

The method we decided upon was to assign a letter on a five-point sensitivity scale (A to E) to each occupation on the basis of both the minimum $1/S_{ij}$ for that occupation and the corresponding x_{ij} . The minimum $1/S_{ij}$ does in fact give a rough indication of the industrial concentration of occupations. If the minimum $1/S_{ij} = 1$, the occupation is entirely concentrated in one industry; as the minimum of $1/S_{ij}$ increases, the concentration tends to decline though this may clearly not always be the case. The corresponding x_{ij} measures the relative importance of

(1) \div means approximately equal

the given occupation in what is thus the most important industry.

The following table shows the way in which the scale has been drawn up. The breaks in the scale were arrived at after plotting x_{ij} and $1/S_{ij}$ on a graph to pick out the 'natural' gaps between the points. This was done in order to reduce as much as possible some of the arbitrariness in the choice of the relevant x_{ij} and $1/S_{ij}$.

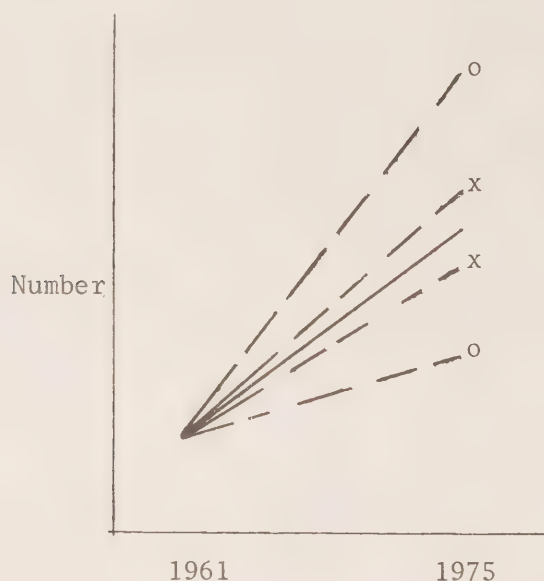
Scale	x_{ij} (%)	Minimum $1/S_{ij}$ (%)
A	2.0 - 99.9	over 2.0
B	0.0 - 1.9	over 2.0
	20.0 - 99.9	1.0 - 1.9
C	2.0 - 19.9	1.0 - 1.9
D	0.0 - 1.9	1.2 - 1.9
E	0.0 - 1.9	1.0 - 1.1

The scale that we have devised is nevertheless fairly subjective and arbitrary since there was no objective criterion to specify it. However, it does appear to confirm some of our impressions about the sensitivity of the final projections to alternative assumptions.

An A on the scale represents an occupation in which, in our opinion, the range covered by the alternative 1 and 2 projections provides a fairly good indication of the manpower requirements. The sensitivity gets progressively greater through to E, which represents those occupations which are highly sensitive to alternative assumptions: in these occupations the projections will not provide the full range of projections of future manpower requirements; here there is clearly a need for further research to provide more insight into the determinants of occupational requirements and to examine the effects of alternative assumptions.

The following diagram may help to illustrate. An A indicates that the projection can be expected to change only slightly in response to changes in the assumptions: thus the two alternative projections indicate a large part of the range of possible projections. This may be illustrated by the two x 's shown. An E, however, indicates that alternative assumptions may generate large changes in the projection so that

the two projections indicate a relatively smaller part of the full range of alternative projections. This is illustrated by the o's shown:



The sensitivity scale has been designed on the basis of the projections for Canada and hence it cannot be applied to the regional projections. It is clear that the sensitivity of the regional projections may well be less than the national projections but in many cases it will probably be somewhat greater. For this reason, we feel that the arbitrary procedure of assigning the next lower letter on the national scale to the regional projections may provide a fairly conservative approximation for the regional projections. In this case occupations with a D or E at the national level would receive an E at the regional level. Because of the smaller numbers involved at the regional level, it is also advisable that the projections with less than about 1,000 people should be used with some caution and we suggest that they too be placed in the E category.

IV. Further Assessment of the Results

Sensitivity analysis provides a greater understanding of the range of possible variation in the projections of occupational requirements and hence some indication of their limitations. However, simple checks

for consistency and comparison with other projections may also be undertaken to ensure that the projections make good sense. We applied such checks continuously at each stage of the analysis and we have already briefly described some of these in Chapter 4. For example, we compared our total employment projection with that implied by the labour force projection made by the Economic Council of Canada; similarly, we made separate projections for the occupation divisions, major groups and classes for each industry and then compared these with one another. Some of these internal and external checks are described in the following pages.

(a) Consistency of Regional and National Projections

The projected manpower requirements for each occupation were obtained by multiplying the projected level of employment in each industry by the projected proportion that employment in the given occupation forms in that industry, and summing over all industries. Projections were obtained separately for Canada and for each region, and the regional sum was then compared with the national projection. The two projections were strikingly similar in all occupations: the absolute difference was never greater than a few hundred persons, and it invariably represented a very small proportional difference.

The high consistency between the two projections obviously arises partly because of the way in which the regional projections have been derived and the internal consistency in the projections at earlier stages in the analysis: for example, the national projection of employment in each industry was constrained to equal the sum of the regional employment projections. Nevertheless the conditions for strict consistency between the regional and national occupational projections can be derived in the following way.

Using our previous notation, employment in the i^{th} occupation is given by,

$$E_i = \sum_j x_{ik} y_j$$

If we drop the i subscript for simplicity, and let the subscripts 0 and 1 denote 1961 and 1975 respectively, and r and n denote regional and national projections respectively, then we have

$$E_{ro} = \sum_j x_{jro} y_{jro}$$

$$E_{no} = \sum_j x_{jno} y_{jno} = \sum_r \sum_j x_{jro} y_{jro}$$

$$y_{jro} = \frac{\sum_r y_{jro}}{r_{jro}}$$

$$y_{jrl} = \frac{\sum_r y_{jrl}}{r_{jrl}}$$

and, since the projected change in the regional occupational distribution was assumed to be the same as the projected change in the national occupational distribution for each industry,

$$\frac{x_{jrl}}{x_{yro}} = \frac{x_{jnl}}{x_{jno}}$$

If $\frac{\sum_r E_{r1}}{r_{r1}} \div E_{nl},$

then $\frac{\sum_r \sum_j x_{jrl} y_{jrl}}{r_{jrl}} \div \frac{\sum_j x_{jnl} y_{jnl}}{j_{jnl}}$

and by substituting for x_{jrl}

$$\sum_r \sum_j \left[\frac{x_{jnl} y_{jrl} x_{jro}}{x_{jno}} \right] \div \sum_j x_{jnl} y_{jnl}$$

which, by reversing the summation signs, becomes;

$$\sum_j x_{jnl} \left[\frac{\sum_r y_{jrl} x_{jro}}{x_{jno}} \right] \div \sum_j x_{jnl} y_{jnl}$$

and this implies that

$$\frac{\sum_r y_{jrl} x_{jro}}{x_{jno}} \doteq y_{jnl}$$

$$\text{i.e.: } \sum_r y_{jrl} x_{jro} \doteq y_{jnl} x_{jno} \quad (a)$$

If we now substitute for x_j

$$x_j = \frac{e_j}{y_j}$$

where e_j is employment in the i^{th} occupation and j^{th} industry, with r , n , o and l omitted, then the approximation (a) may be written, by substituting for x_{jro} and x_{jno} :

$$\sum_r \left[\frac{y_{jrl} e_{jro}}{y_{jro}} \right] \doteq \frac{y_{jnl} e_{jno}}{y_{jno}} \quad (b)$$

Equation (b) will hold either if

$$\frac{e_{jro}}{y_{jro}} \doteq \frac{e_{jno}}{y_{jno}} \quad (c)$$

or

$$\frac{y_{jrl}}{y_{jro}} \doteq \frac{y_{jnl}}{y_{jno}} \quad (d)$$

Observation shows that e_{jro}/y_{jro} differs substantially from one region to the other and for Canada as a whole. Hence consistency between the regional and national occupational projections implies that the projected change in employment in each industry is approximately constant over the five regions and Canada. This may be roughly true for the secondary and tertiary industries but it is certainly not true for the primary industries. However since national employment in the primary industries is generally dominated by employment in these industries in one or two regions, the differences will again tend to be small.

Thus the striking similarity between the sum of the regional projections of occupational requirements and the national projection provides a check on the projections in the sense that the assumptions made at the regional level are consistent with those made at the national level. It does not, however, provide a check on the validity of the regional projections since the two sets of projections are not independent of each other.

(b) The Use of Past Occupation-Industry Matrices

As we have indicated, it is important that a range of projections of occupational requirements should be provided to form a more reliable basis for manpower planning. It is fairly easy to obtain, as we have, alternative projections of occupational requirements using alternative projections of the industrial structure of employment; but making alternative projections of the occupational distribution of each industry is a more difficult and time consuming task.

It has been suggested elsewhere that the occupational structure of an industry appears to change only slowly over a period of time (32, page 21). On this assumption it would seem that reasonable alternative projections may be obtained by using the past occupational distributions of the various industries. However, since this may not be strictly valid, especially for the broad industry groups we are using in this study, some attempt must be made to test the adequacy of using such an approach.

We therefore projected a set of occupational requirements for Canada in 1951 and in 1961 using the occupational distributions of the various industries in 1941 and in 1951 and the level of industrial employment in 1951 and 1961 respectively. Thus, we projected the occupational

requirements using the observed levels of employment by industry and the occupational distributions of industries obtained from the previous census.

The projections obtained for 1951 and 1961 differed substantially from the requirements observed in those years. In 1951, slightly more than 30% of the projections for all occupations fell within $\pm 10\%$ of the observations; for 1961, the figure was closer to 40%. At our level of aggregation, the observed occupation-industry matrices do not therefore appear to give reliable projections.

Moreover, the discrepancies are not related in a meaningful way to each other or to the sizes of occupations. For example almost half of the occupations which showed small discrepancies for 1961 (between $\pm 5\%$) showed relatively large discrepancies for 1951 (greater than $\pm 25\%$). Similarly, the correlation coefficients between the ranks of the discrepancies, and the ranks of the sizes of the various occupations were only 0.105 and 0.308 for 1951 and 1961 respectively, indicating that the discrepancy is almost independent of the size of the occupation.

We have, however, calculated projections for 1975 using the projections of the industrial structure in 1975 and the observed 1961 occupational distributions of industries. As can be seen from Table 5.1, the discrepancies between these and our actual projections for 1975 follow much the same pattern as the discrepancies derived for 1951 and 1961: thus only 26.7% of the derived projections fall within $\pm 10\%$ of our actual projections. The similarity does give us some further confidence in the consistency of our results since it implies that the differences we obtained by projecting the occupational distributions of industries are roughly similar to the differences derived from observed data.

(c) Projections for 1967

As we mentioned earlier, data for detailed occupations by industry are normally available only in census years and the most recent occupation-industry matrix used in this study refers to 1961. However, annual estimates of employment in each occupation division are available from the Labour Force Survey so that we could roughly check our projection method by making projections for 1967 and comparing them with the Labour Force Survey estimates.

TABLE 5.1
DISCREPANCIES BETWEEN PROJECTIONS AND OBSERVATIONS
(1951 AND 1961) AND THE PROJECTIONS FOR 1975

Percentage Discrepancy	Percentages		
	1951	1961	1975 (a)
25 and over	17.0	20.5	17.1
20 - 24	7.3	2.9	3.3
15 - 19	4.0	5.3	7.6
10 - 14	7.3	5.8	5.7
5 - 9	8.9	7.0	6.2
-4 - 4	16.9	18.1	13.8
-5 - -9	5.6	13.4	6.7
-10 - -14	10.5	7.0	7.6
-15 - -19	4.0	4.7	8.1
-20 - -24	4.8	3.5	4.8
-25 and below	13.7	11.7	19.0
Total	100.0	100.0	100.0

(a) Based on Alternative 1.

The comparison is, however, only very approximate since the Labour Force Survey is a 1% population survey and hence suffers from large sampling errors. In addition, differences will also arise because of conceptual differences between the Labour Force Survey and the Employment Survey, from which our employment estimates have generally been obtained. Our comparison is therefore made in terms of the percentage occupational distribution rather than in absolute form.

The graphs in Figure 5.1 show Labour Force Survey estimates of the proportion that employment in each occupation division forms of total employment for Canada for each year in the period 1961-68. (Note that some of the graphs show large changes in the period 1964-66 which may be associated with the substantial changes in the sample used for the Labour Force Survey introduced in the same period (13).) The 1961 observation derived using our employment estimate in each industry and the census occupational distribution for each industry, and our projection for 1967 is also plotted and circled on the graphs.

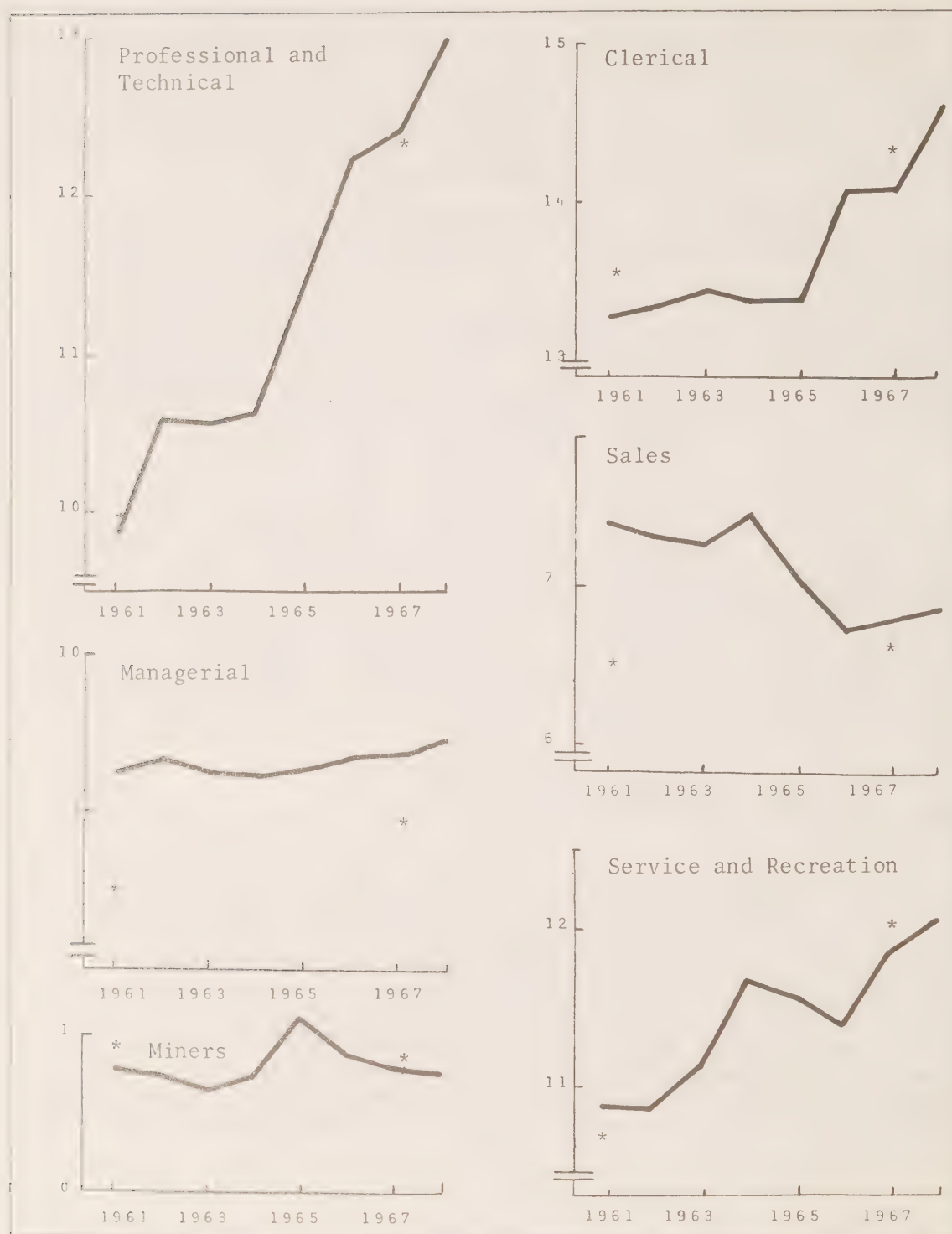
When we consider the differences which existed in 1961, the projections for 1967 appear to fit in quite well with the Labour Force Survey estimates. The two possible exceptions are the projections in transportation and communication occupations and craftsmen, production process and related workers; but after careful re-examination of our graphs and derivation of reasonable alternatives we found that we could not alter the projections substantially. It may well be that in these two cases changes in technology which have taken place since 1961, and which could not therefore appear in our data, have generated significant changes in trend.

(d) Comparison with Other Projections

Comparison with other occupational projections also provides a means of roughly checking the validity of the results. A few projections have been made for individual occupations, but these are often not comparable with our projections for these occupations because of definitional differences and basic differences in method. Our projections are based on simultaneous projections in all occupations and hence the projection in any occupation depends implicitly on the projection in every other occupation. Projections of single occupations, however, do not make allowances for the growth of other occupations and may therefore be inconsistent with the projections in other occupations.

FIGURE

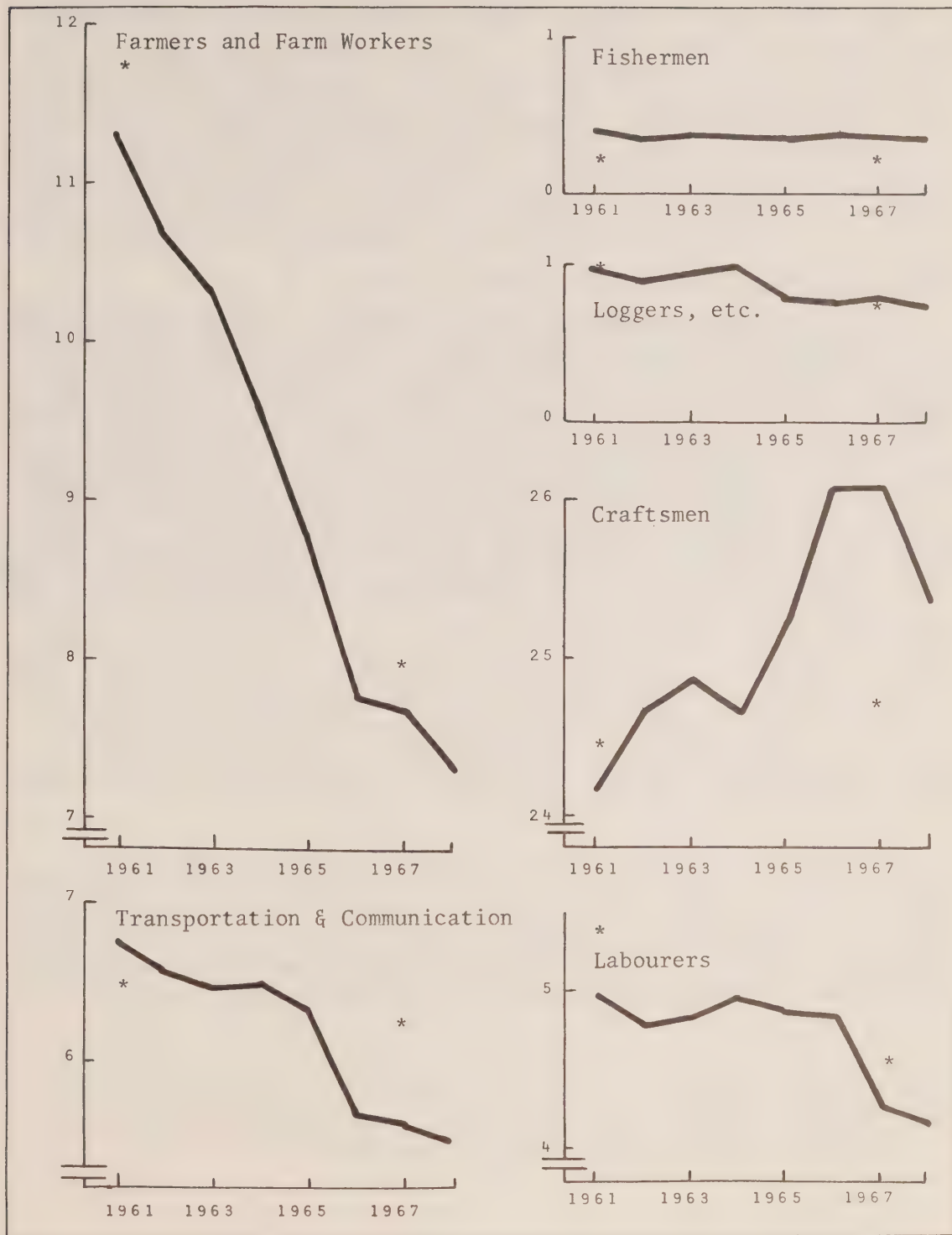
DISTRIBUTION OF LABOUR FORCE BY OCCUPATION



Source: Labour Force Survey.

Note: * = Department of Manpower and Immigration estimates.

DIVISION FOR CANADA, 1961-1968



For example, if we compare our projections of physicians and dentists with the projections of medical and dental manpower made for the Royal Commission on Health Services, we can see some of the problems that arise. For physicians and surgeons, Judek made projections for each year on the basis of both a constant and improving population/physician ratio (36, page 394) which were 857 and 755 respectively for 1976. If we derive, from our two alternative projections of occupational requirements, the implied population/physician ratios, we obtain values of 527 and 507. These are not strictly comparable with the ratios used by Judek since our projections are based on the "medium" population projections for 1975 made by the Dominion Bureau of Statistics.

Furthermore, our projections of physicians and surgeons were not made with a population/physician ratio at all: they were derived from the projections of employment and occupational structure, and so were governed by the assumed rate of growth of the general demand for services, since physicians and surgeons are employed mainly in that industry. Employment in the total service industry is projected to increase much more rapidly than total population, reflecting the increasing demand for services because of increasing income, changing tastes, and so on. Thus our projection of requirements implicitly takes into account this shift in consumer demand towards services. Judek allowed for an increase in the demand for health services more directly by assuming a physician/population ratio of 755 in 1976. Thus, the difference between Judek's projections and ours is simply a matter of the assumed rates of improvement in demand⁽¹⁾. Obviously other alternatives could be chosen. This is shown by the fact that the ratio has already improved at a faster rate than Judek assumed: in 1968, the population/physician ratio was estimated at 775 (using data obtained from the Department of National Health and Welfare, 36, page 394) which is lower than the improved ratio of 787 assumed by Judek for 1971.

This illustrates the need for a much more detailed study of the medical service sector in order to examine the implications of the full range of possible levels of demand for health service within the context of the growth of total demand for all services. This point about the further disaggregation of industry groups in making our occupational projections is generally applicable for refining our projections.

(1) *It should be noted that the projection of requirements implies nothing about the availability of resources.*

MacFarlane made projections of dentists, based on a variety of population/dentist ratios, two of which correspond to the ratios for Canada and British Columbia in 1962: 3,108 and 2,406 respectively (38, page 27). Our projections for dentists, once again, were not made by studying the population/dentists ratios. Dentists are mainly employed in the service industry, and we have assumed, as mentioned above, a high growth rate in the service industry employment due to the shift in consumer demand towards services. Our projections for 1975 imply ratios 2,477 and 2,401 for the alternative 1 and 2 projections, both of which are very close to the improved ratio assumed by MacFarlane.

However, it must be remembered that MacFarlane could have arrived at the same projections by assuming a slower growth in population and a corresponding slower increase in the demand for dentists' services, or by assuming a faster growth in the population and a corresponding increase in the demand for dentist services. Similarly, our projections would be unaltered substantially if we took a smaller increase in the demand for services in general with a lower population estimate. The range of possible requirements for dentists is much wider than our two alternatives indicate, suggesting that the similarity with other projections can be accidental. The assessment of projections, ours or others, must rest on the method adopted, its internal consistency, its overall structure, and its ability to answer our questions.

CHAPTER 6

MAKING THE REQUIRED INFLOW PROJECTIONS

For many practical purposes it is desirable to have projections of both requirements and of supply in order to form a view about potential future imbalances in the manpower markets. Some of the conceptual and practical difficulties in making manpower requirements projections have already been described. On the supply side there is however, at present, no satisfactory method of making projections because information is lacking about the incidence of substitution between occupations. There is no adequate knowledge of the incidence of movement from the educational system into different occupations in the labour force, nor of movement between occupations within the labour force; and in neither case are the reasons for these movements understood. It is therefore, at present, virtually impossible to project the differences between demand and supply for a given time in the future. Moreover, the differences between demand and supply which may exist at any time in the future are heavily influenced by the cyclical and seasonal state of the economy and may give a misleading impression of longer-term trends. For these reasons the concept being projected in this study is of 'required manpower inflow'.

The 'required manpower inflow' is defined as the difference between the total stock of manpower required in 1975, and the stock available in the base year of 1961 adjusted only for the estimated attrition due to death and to the withdrawal from the labour force of older workers during the 1961-1975 period. Geographic and occupational mobility are assumed to have no effect on the estimates. The required inflow shows the requirement for manpower which will be generated by the growth and changing structure of economic production and demographic processes within the labour force. The resulting projection for each occupation is therefore of the quantity of manpower which will need to be supplied during the period 1967 to 1975 from a variety of sources.

To arrive at these required inflow projections, we began by making an estimate of the survivors of the 1961 labour force in 1975, by region and occupation, taking into account only the attrition due to death and withdrawal from the labour force of the older workers. The basic data used for this purpose are the data on the 1961 labour force by age and occupation, mortality rates and the labour force participation rates for 1961, and projections of these rates for 1975. It was assumed that all workers aged 60 years or over in 1961 (74 or over in 1975) would not be in the labour force in 1975. For the other age cohorts, the first step was to calculate survival coefficients, i.e. coefficients indicating the proportion of the 1961 labour force still living in 1975. The mortality rates used for this purpose are those for the year 1965, the latest available at the time this work was begun. These rates are available separately for each sex, by age group and province: no distinction is made between labour force participants and those not in the labour force, or between workers in different occupations. The survival coefficients for each age cohort, by sex and province, were calculated for the two five-year and one four-year period (totalling 14 years and covering the 1961-1975 period) according to the formula

$$p_{t+x}^i = p_t^i (1 - d_t^i)^x$$

where

p_t^i = population of age group i at time t

x = time period considered (either 5 or 4 years)

d_t^i = age-specific death rate at time t , i referring to age group

Next, an adjustment was made to the calculated survival coefficients for the older workers in order to allow also for withdrawals from the labour force during the 1961-1975 period. The initial intent was to adjust for withdrawal due to retirements only. However, since a separate measure for retirements is not readily available, it was decided to adjust for total withdrawal, according to the change in participation rates as workers become older. D.B.S.'s 'Labour Force' survey data

indicate that participation rates drop considerably for both sexes beginning with the group aged 55-64 years. Consequently, adjustments for withdrawals were made in the case of all workers aged 55-64 years or older.

For convenience in the subsequent calculations, it was assumed that the participation rates for the groups aged 54-63 and 64 and over, used in this report are comparable to those of the groups aged 55-64 and 65 and over, respectively, in the 'Labour Force' survey data. For the same reason, the ten-year age groups used in the survey data were considered as two five-year age groups, with the two five-year groups of a ten-year group being assigned the same participation rate.

The adjustments for withdrawal from the labour force of workers aged 54-58 years or older in 1975 were made by multiplying the survival coefficients (derived as previously outlined) for these workers by the ratio of the 1975 participation rate for a cohort to its 1961 participation rate. These ratios are indicated in Table 6.1.

Two points should be noted regarding the adjustments for withdrawals from the labour force using the ratios indicated in Table 6.1. First, the ratios are based on participation rates for Canada as a whole: these were applied to the estimates for individual provinces. Second, in the case of women aged 54-58 and 59-63 years in 1975, withdrawal is negative, i.e. the ratio of the 1975 participation rate to the 1961 rate is greater than one. This is indicative of the greater participation in the labour force which is expected of women in these age groups by 1975.

The application of the survival coefficients to the number in each age group by sex, and within each occupation class and province, would have meant an excessive number of calculations. In order to reduce them to a more manageable number, average coefficients weighted by the number in each age group were derived for each province and sex. These weighted average survival coefficients were then applied to the number of workers by sex in each occupation and province in 1961, to arrive at an estimate of the number in the labour force in 1975.

The final steps in deriving the estimates of the labour force, by region and occupation, which would remain after adjusting the 1961 stock for deaths and withdrawals of older workers during the 1961 to 1975 period, were to add the estimates by sex to obtain provincial labour force totals, and to sum these totals in the case of the Atlantic and Prairie provinces to obtain regional totals.

TABLE 6.1

PARTICIPATION RATES BY SEX AND AGE, CANADA,
1961 AND 1975

	Age in 1961	Part. Rate %	Age in 1975	Part. Rate %	Ratio, 1975 to 1961
<u>Men:</u>	40-44	97.7	54-58	85.7	0.8772
	45-49	95.8	59-63	85.7	0.8946
	50-54	95.8	64-68	23.1	0.2411
	55-59	86.6	69-73	23.1	0.2667
<u>Women:</u>	40-44	30.1	54-58	38.0	1.2625
	45-49	32.2	59-63	38.0	1.1801
	50-54	32.2	64-68	6.9	0.2143
	55-59	23.2	69-73	6.9	0.2974

In summary, there are three main aspects of the derived estimates of survivors:

(i) Mortality rates for 1965 were used as an average for the 1961-1975 period, and workers in all occupations were assumed to have the same mortality rate.

(ii) Geographic and occupational mobility are assumed to have no effect on the estimates.

(iii) The use of participation rates as an indicator of withdrawal from the labour force by older workers has the effect of increasing rather than decreasing the estimate of the number of women in the older age groups expected to be in the 1975 labour force.

CHAPTER 7

THE RESULTS AND THEIR USES

I. Occupational Requirements in 1975

The projections of manpower requirements by occupation (Appendix Table I.1) were obtained by multiplying the projected proportion that employment in a given occupation forms of employment in each industry by the projected level of employment in each industry, and then summing over all industries. Since we made two projections of employment in each industry this gave us two projections of occupational employment. As we indicated in the preceding chapter, the projections for each occupation have been coded with a letter on a sensitivity scale: an A indicates that the projections are quite insensitive to alternative assumptions so that the chosen alternatives will probably give a good approximation of the range of actual requirements in these occupations; on the other hand, an E indicates that the projections are highly sensitive to alternative assumptions so that the projections derived will not necessarily provide an indication of the full range of possible occupational requirements.

For convenience, the projections for the occupation divisions are reproduced in Table 7.1. These are all fairly insensitive to alternative assumptions and have sensitivity ratings of either A or B. In contrast, some of the regional projections are particularly small, e.g. fishing and trapping, and these may therefore be rather sensitive.

In general, the differences between the alternative 1 and 2 projections are fairly small in both absolute and relative terms. The main exceptions are the primary occupations which, because of their concentration in the corresponding primary industries, reflect the uncertainty that exists about developments in the primary sector. The alternative 1 projections, which are based on our higher employment projections in

PROJECTED MANPOWER REQUIREMENTS BY

	ATLANTIC		QUEBEC	
	Alternative			
	1	2	1	2
Managerial	49.4	51.1	205.8	209.8
Professional and Technical	89.0	95.2	404.0	416.4
Clerical	73.0	75.9	369.3	378.6
Sales	39.1	41.5	158.6	163.6
Service and Recreation	84.0	90.0	348.7	361.7
Transportation and Communication	46.0	46.9	161.7	167.7
Farming	21.4	16.4	84.6	77.7
Logging	8.8	8.0	14.1	12.6
Fishing	18.2	12.3	0.8	0.7
Mining	10.3	9.5	11.3	10.4
Craftsmen	151.0	146.6	634.3	618.8
Labourers	32.1	31.8	91.2	90.9
All Occupations	622.2	625.3	2,484.4	2,509.1

Source: Appendix Table I.1

7.1

OCCUPATION DIVISION BY REGIONS, 1975

Thousands							
ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Projections							
1	2	1	2	1	2	1	2
306.3	305.6	122.2	123.7	79.8	82.2	763.7	772.6
516.5	521.6	223.2	227.1	132.4	136.0	1,366.8	1,397.5
575.8	578.2	202.0	207.1	123.4	128.6	1,340.6	1,366.0
237.0	238.5	92.3	95.6	57.7	61.1	585.6	601.2
460.8	470.5	204.4	210.3	125.6	130.2	1,222.1	1,261.4
194.6	196.9	80.4	82.9	52.4	53.8	533.3	546.2
126.4	114.7	199.4	171.0	25.7	23.6	457.7	403.8
7.5	6.8	6.8	4.2	11.9	10.6	50.8	43.9
0.8	0.7	2.0	1.5	3.2	2.8	24.6	17.9
21.1	17.8	12.6	11.2	6.1	5.3	59.4	52.5
919.0	887.5	288.7	279.3	200.5	195.9	2,198.9	2,133.4
118.0	116.3	51.8	50.3	31.4	30.9	322.5	318.5
3,483.7	3,454.9	1,485.8	1,464.2	850.0	861.0	8,926.0	8,914.4

the goods-producing industries and our lower employment projections in the service-producing industries, are higher than the alternative 2 projections only for the primary occupations, craftsmen and labourers. This reflects the greater importance of these occupations in the goods-producing industries than in the service-producing industries.

Manpower requirements are projected to be greatest in Ontario for all occupations except some of the primary occupations. Ontario and Quebec together account for roughly 60% to 70% of the national requirements in almost every occupation. In agricultural occupations, requirements are projected to be greatest in the Prairie regions, while requirements for fishermen are projected to be greatest in the Atlantic region. In the other primary occupations, requirements tend to be fairly evenly distributed among all regions.

In all regions, the requirements for craftsmen, production process and related workers represent between 1/5 and 1/3 of total manpower requirements and thus greatly outnumber requirements in any other occupation. Requirements in professional and technical occupations are the second highest but these are followed closely by requirements in clerical and sales occupations and, in the Prairie region, by requirements for farmers and farm workers. In all regions except the Prairie region, requirements in the primary occupations are projected to form only a small proportion of total requirements.

If now we examine the projected growth for the period 1961-75 in manpower requirements in each occupation (Table 7.2), some further interesting differences emerge. Once again the differences between alternatives 1 and 2 are largest for the primary occupations. Similarly, the occupations more closely associated with the goods-producing industries (primary occupations, craftsmen, labourers) show lower rates of growth than the other occupations.

In all regions the projected growth is greatest for professional and technical occupations: here requirements are projected to more than double by 1975. The projected growth is appreciably smaller for other occupations and requirements in the primary occupations are generally projected to fall, or to increase only slightly.

The patterns of growth also differ over regions but not as noticeably as the requirements themselves. The projected growth in many occupations in the Atlantic region is substantially lower than that in the other regions. Ontario and Quebec show declines for miners and

related workers whereas the other regions show substantial increases. Requirements for labourers are not projected to change much in any region apart from the Prairies.

The projected percentage occupational distributions for the occupation divisions are compared with the observed distributions for 1961 in Table 7.3. The latter have been derived using our annual estimates of employment in each industry for 1961 together with the occupational distribution of each industry obtained from the census; in addition, the 'occupation not stated' division in each industry has been distributed proportionately among all occupations.

The most interesting feature of the figures in Table 7.3 seems to be the similarity in the occupational distributions among the regions to 1975. The general decline in the relative importance of the primary occupations, and of farmers and farm workers in particular, indicates that by 1975 only the Prairie region will have a substantial requirement for these occupations. In the other occupations, our projections indicate a reduction in the variation among regions. A good example is provided by changes in craftsmen, production process and related workers; the relative importance of this occupation is projected to increase in the Atlantic and Prairie regions but to fall in the others.

Professional and technical occupations are projected to increase their share of employment in each region to between 15% and 16% in 1975; this increase represents the largest relative change in the occupational structure in each region. The changes in managerial, sales and transport and communication occupations are small while clerical and service and recreation occupations are both projected to increase their relative importance. In contrast, requirements in the primary occupations and for labourers are projected to become relatively less important in total employment.

II. Required Manpower Inflow, 1961-1975

The projections of manpower requirements by occupation represent the manpower stock which will be necessary in 1975 to satisfy our assumptions about the level and structure of final demand and the technological structure of industries. The requirements may be met in either of two basic ways: (a) by the existing manpower resources in each occupation and (b) by additions from persons outside the labour force,

PROJECTED GROWTH IN MANPOWER REQUIREMENTS BY

	ATLANTIC		QUEBEC	
	Alternative			
	1	2	1	2
Managerial	29.3	33.8	59.0	62.1
Professional and Technical	96.5	110.2	149.5	157.2
Clerical	47.2	53.0	77.5	82.0
Sales	28.2	36.1	56.9	61.8
Service and Recreation	57.0	68.2	113.8	121.8
Transportation and Communication	25.7	28.1	44.5	49.9
Farming	-61.6	-70.6	-39.0	-44.0
Logging	-45.0	-50.0	-22.5	-30.8
Fishing	59.6	7.9	..	..
Mining	21.2	11.8	-7.4	-14.8
Craftsmen	55.2	50.7	44.2	40.7
Labourers	-2.4	-3.4	-1.0	-1.3
All Occupations	30.7	31.4	57.4	59.0

Note: .. As the 1961 and 1975 labour force figures in these occupations are small, the growth rate is too sensitive to be useful.

7.2

OCCUPATION DIVISION BY REGION, 1961 to 1975

Percentages							
ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Projections							
1	2	1	2	1	2	1	2
53.3	53.0	49.6	51.4	54.4	59.0	52.7	54.5
128.6	130.9	126.4	130.3	146.6	153.2	135.2	140.5
66.9	67.6	69.3	73.6	80.4	88.0	69.9	73.2
55.4	56.4	50.1	55.4	53.1	62.1	53.1	57.2
90.7	94.7	87.0	92.4	99.7	107.0	95.4	101.7
45.8	47.5	28.6	32.6	42.8	46.6	40.0	43.4
-23.5	-30.6	-32.3	-41.9	-4.1	-12.0	-33.4	-41.2
-15.7	-23.6	..	..	7.2	-4.5	-12.9	-24.7
..	..	..	..	..	..	43.8	4.7
-9.3	-22.6	34.0	19.1	45.2	26.2	2.6	-9.3
56.3	51.0	70.8	65.3	63.3	59.5	54.0	49.5
2.2	0.8	15.9	12.5	4.7	3.0	1.2	-0.1
58.3	57.0	40.9	38.9	66.8	68.9	53.2	53.0

TABLE

DISTRIBUTION OF MANPOWER REQUIREMENTS BY

	ATLANTIC		QUEBEC	
	1961	1975(a)	1961	1975(a)
Managerial	8.0	8.2	8.2	8.4
Professional and Technical	9.5	15.2	10.3	16.6
Clerical	10.4	12.1	13.2	15.1
Sales	6.4	6.6	6.4	6.5
Service and Recreation	11.2	14.4	10.3	14.4
Transportation and Communication	7.7	7.5	7.1	6.7
Farming	11.7	2.6	8.8	3.1
Logging	3.4	1.3	1.2	0.5
Fishing	2.4	2.0	0.1	0.0
Mining	1.8	1.5	0.8	0.4
Craftsmen	20.4	23.4	27.9	24.7
Labourers	6.9	5.1	5.8	3.6
All Occupations	100.0	100.0	100.0	100.0

(a) Based on Alternative 2 projections.

from immigration, from manpower re-training programs, and so on.

For any occupation, the difference between the manpower requirements in the projection year and the base year manpower stock corrected for attrition through mortality and retirement represents the manpower gap which must be filled during the projection period. This manpower gap, which we have called the required manpower flow, may be met from any or all of a number of possible sources of manpower, as described in the following schematic presentation:

OCCUPATION X			
Requirements		Resources	
Manpower Requirements 1975.....	xxx	Additions to labour force 1961-75 less withdrawals from labour force	xxx
<u>less</u> 1961 manpower stock less mortality and retirement - 1961-75.....	xxx	<u>Plus:</u> Entrants from re-training programs, 1961-75.....	xxx
		<u>Plus:</u> Market transfers from other occupations, 1961-75, less Market transfers to other occupations, 1961-75.....	xxx
		<u>Plus:</u> Migration from other regions 1961-75, less migration to other regions, 1961-75 (1)	xxx
		<u>Plus:</u> Immigration from outside Canada 1961-75 less emigration to outside Canada 1961-75.....	xxx
<u>equals</u>	—	<u>equals</u>	
Required Manpower Inflow 1961-75	xxx	Additional Manpower Resources	xxx

(1) *This flow is relevant only when considering the imbalance between requirements and resources at the regional level; at the national level, these interregional flows cancel each other out.*

One of the aims of efficient manpower planning is clearly to meet the required manpower inflow in the most efficient or desirable way. To do so it is necessary to assess the potential manpower resources available from each of the possible sources in order to be able to act on each of the policy variables to produce the desired effects. Thus the required manpower inflow provides some of the information necessary for planning, in a consistent and related way, policies and programs concerned with such things as both external and internal migration, manpower re-training, investment in different types of education, and so on.

In order to calculate the required manpower inflow for the period 1961-75 for each occupation, (1) we first had to estimate the survivors of the 1961 manpower stock in 1975. The first step was to calculate survival rates for each sex and age-group: 1965 mortality rates were used for this purpose. These survival rates were then adjusted for withdrawal from the labour force of the older workers (i.e. those aged 55 or more in 1965): this was done by simply multiplying the survival rates by the ratio of the projected participation rates for the various age-sex groups in 1975 to the participation rates for the corresponding groups in 1961.

The application of the survival-retirement coefficients to each sex and age-group for each occupation and province would have taken a very long time to carry out. For this reason, we calculated instead an average coefficient weighted by the number in each age-group for each sex, occupation and province. These coefficients were then multiplied by the base year manpower stock by sex and summed over the provinces to give the estimated labour force survivors in each occupation and region. Survivors are given by major occupation groups in Table 7.4, and by occupation class in Appendix Table IV.

The required manpower inflow for the period 1961-75 is given for each occupation in Appendix Table II.1; for convenience the figures for the occupation divisions are reproduced in Table 7.5. A negative sign indicates that an outflow rather than an inflow is required over the projection period.

Once again we note that the required manpower inflow is generally greatest for craftsmen, production process and related workers. The

(1) *A full account of the method and calculations is given in Chapter 6.*

TABLE 7.4

ESTIMATED NUMBER OF SURVIVORS OF THE 1961 LABOUR FORCE
IN 1975 BY OCCUPATION DIVISION BY REGION

	ATLANTIC	QUEBEC	ONTARIO	PRAIRIES	PACIFIC	Thousands CANADA
Managerial	32.8	108.5	157.0	68.1	43.2	409.7
Professional and Technical	40.8	149.0	187.0	83.6	45.1	505.6
Clerical	44.6	185.9	292.0	105.7	61.3	689.6
Sales	27.7	85.1	124.7	55.3	33.4	326.2
Services and Recreation	48.7	154.0	206.9	95.2	54.2	558.9
Transport and Communication	30.1	89.7	102.5	47.5	28.3	298.0
Farmers	26.5	104.3	129.7	212.8	18.5	492.3
Loggers	14.0	24.7	8.6	3.0	9.4	59.5
Fishermen	16.2	2.1	1.4	2.3	3.7	25.3
Mining	7.9	10.0	18.9	7.5	3.6	47.8
Craftsmen	86.8	380.2	460.4	141.7	101.3	1,170.1
Labourers	28.9	78.8	91.0	37.3	24.6	260.6
All Occupations	404.9	1,372.4	1,780.1	860.2	427.7	4,844.2

Source: Appendix Table IV

Note: For each region, the Appendix Table IV numbers in 'Occupation Not Stated' have been distributed proportionately amongst all other occupation divisions.

differences over occupations in Table 7.4 are however smaller than the differences over occupations in Table 7.1; for example, the differences in all regions and Canada between the craftsmen division and the professional and technical division are smaller in Table 7.5 than in Table 7.1 since they reflect the differences in the age and sex composition of these two occupations in 1961. The required manpower inflow is lowest for labourers and the primary occupations, and some of the latter show outflows in some regions.

As in the case of the manpower requirements, the required manpower inflow is projected to be greatest in Ontario for all occupations except the primary occupations. Quebec and Ontario again account for the bulk of the required manpower inflow in many occupations. Note that the outflow of loggers and related workers is much greater in Quebec than in Ontario even though the projected change in the manpower requirements is much the same in both regions. This reflects the different age structures of loggers in the two regions: in 1961 the average age of male loggers was 33 in Quebec but 38 in Ontario.

It is also interesting to compare the proportion that the required manpower inflow for 1961-75 forms of manpower requirements in 1975 for the various occupations. These are included in Appendix Table II.2 for all occupations and in Table 7.6 for the occupation divisions. These figures represent the part of manpower requirements which must be provided by additional manpower resources and hence reflect the relative importance of the required manpower inflow in each occupation. A high positive or negative value indicates that the relative increase or decrease necessary in the given occupation and region is high; a low positive or negative value indicates that the relative increase or decrease necessary is low. In general, the higher (positive or negative) the value, the greater the need for appropriate manpower planning.

In each region the figures are greatest for professional and technical occupations and lowest in the primary occupations. Thus the relative increases needed are highest in the former and lowest in the latter. There are also substantial differences between regions; for example, the figures tend to be lower in the Atlantic region than in other regions, thus indicating that the necessary relative increases are lower for that region. The differences are particularly striking for the primary occupations; for example, the figure for loggers and related workers is much higher (negative) than for other occupations thus indicating the greater need for manpower planning.

REQUIRED MANPOWER INFLOW BY OCCUPATION

	ATLANTIC		QUEBEC	
	Alternative			
	1	2	1	2
Managerial	16.6	18.3	97.3	101.3
Professional and Technical	48.2	54.4	255.0	267.4
Clerical	28.4	31.3	183.4	192.7
Sales	11.4	13.8	73.5	78.5
Service and Recreation	35.3	41.3	194.7	207.7
Transportation and Communication	15.9	16.8	72.0	78.0
Farmers	-5.1	-10.1	-19.7	-26.6
Loggers	-5.2	-6.0	-10.6	-12.1
Fishermen	2.0	-3.9	-1.3	-1.4
Mining	2.4	1.6	1.3	0.4
Craftsmen	64.2	59.8	254.1	238.6
Labourers	3.2	2.9	12.4	12.1
All Occupations	217.3	220.4	1,112.0	1,136.7

Source: Appendix Table II.1

7.5

DIVISION BY REGION, 1961 to 1975

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Projections							
1	2	1	2	1	2	1	2
149.3	148.6	54.1	55.6	36.6	39.0	354.0	362.0
329.5	334.6	139.6	143.5	87.3	90.9	861.3	892.0
283.8	286.2	96.3	101.4	62.1	67.3	651.0	676.4
112.3	113.8	37.0	40.3	24.3	27.7	259.4	275.0
253.9	263.6	109.2	115.1	71.4	76.0	663.2	702.5
92.1	94.4	32.9	35.4	24.1	25.5	235.2	248.1
-3.3	-15.0	-13.4	-41.8	7.2	5.1	-35.6	-88.5
-1.1	-1.8	3.8	1.2	2.5	1.2	-8.7	-15.6
-0.6	-0.7	-0.3	-0.8	-0.5	-0.9	-1.1	-7.8
2.2	-1.1	5.1	3.7	2.5	1.7	11.6	4.7
458.6	427.1	147.0	137.6	99.2	94.6	1,028.8	963.3
27.0	25.3	14.5	13.0	6.8	6.3	61.9	57.9
1,703.6	1,674.8	625.6	604.0	423.3	434.3	4,081.8	4,070.2

REQUIRED MANPOWER INFLOW, 1961 TO 1975, AS A
BY OCCUPATION DIVISON

	ATLANTIC		QUEBEC	
	Alternative			
	1	2	1	2
Managerial	33.6	35.8	47.3	48.3
Professional and Technical	54.2	57.1	63.1	64.2
Clerical	38.9	41.2	49.7	50.9
Sales	29.2	33.3	46.3	48.0
Service and Recreation	42.0	45.9	55.8	57.4
Transportation and Communication	34.6	35.8	44.5	46.5
Farming	-23.8	-61.6	-23.3	-34.2
Logging	-59.1	-75.0	-75.2	-96.0
Fishing	11.0	-31.7	..	..
Mining	23.3	16.8	11.5	3.8
Craftsmen	42.5	40.8	40.1	38.6
Labourers	10.0	9.1	13.6	13.3
All Occupations	34.9	35.2	44.8	45.3

Note: .. As the 1975 manpower requirement figures in these occupations are small, the percentages calculated are too sensitive to be useful.

7.6

PERCENTAGE OF MANPOWER REQUIREMENTS, 1975
BY REGION

Percentages							
ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Projections							
1	2	1	2	1	2	1	2
48.7	48.6	44.3	44.9	45.9	47.4	46.4	47.0
63.8	64.1	62.5	63.2	65.9	66.8	63.0	63.8
49.3	49.5	47.7	49.0	50.3	52.3	48.6	49.5
47.4	47.7	40.1	42.2	42.1	45.3	44.3	45.7
55.1	56.0	53.4	54.7	56.8	58.4	54.3	55.7
47.3	47.9	40.9	42.7	46.0	47.4	44.1	45.4
-2.6	-13.1	-6.7	-24.4	28.0	21.6	-7.6	-21.9
-14.7	-26.5	..	..	21.0	11.3	-17.1	-35.5
..	..	..	..	..	..	-4.5	-43.6
10.4	-6.2	40.5	33.3	41.0	32.1	19.5	9.0
50.0	48.1	50.9	49.3	49.5	48.3	46.8	45.2
22.9	21.8	28.0	25.8	21.7	20.4	19.2	18.2
48.9	48.5	42.1	41.3	49.8	50.4	45.7	45.7

III. Uses of the Projections

The meaning of a projection, and the uses to which it may be put, are governed by the way by which it is made and, in particular, by the assumptions upon which it is based. Therefore, before describing some of the ways in which the projections may be used, it seems important to briefly list some of the main qualifications which must be taken into consideration in their interpretation and use.

The available data with which we have had to work are subject to unknown errors. The employment data are particularly suspect because of large unexplained differences in the two main sources of data: the Labour Force Survey data and the Employment Survey data. The occupation and industry classification have changed between censuses, and though we converted the data to a common 1961 census classification, errors could arise in this conversion process. Moreover, our most recent data for the labour force classified by detailed occupation and industry refers to 1961, and we have made no attempt to correct for the changing nature of occupations which will probably have taken place both before and after 1961.

We have used only twelve industry divisions in this study, partly because of the difficulty of obtaining employment data by more detailed industry breakdown and partly because of the limited time available for the conversion of existing census data. Projections in some occupations, therefore, will clearly be less satisfactory than if it had been possible to make them at a lower level of industrial aggregation. For example, professors and college principals are concentrated in the educational services sector: as employment in these occupations has been growing at a faster rate than that in the service sector as a whole, our projection will tend to underestimate the growth of requirements for professors and college principals to the extent of the differences between the two rates of growth of employment.

The projections were initially derived by the simple extrapolation of logarithmic time trends. Such trends were often difficult to identify because of cyclical fluctuations; this was particularly so in making projections of the occupation distributions of the various industries: we had only three observations (1941, 1951 and 1961) which represented three very different points in the business cycle. Furthermore, the simple extrapolation of a time trend assumes that all the relevant variables will continue to change as they have done in the past.

This is a simplifying assumption, and we have tried to take account of other opinions about the future course of events in arriving at our final projection. Several reasonable alternative assumptions may be made about the growth of the economy, and we have therefore made two alternative projections to provide an indication of how the range of manpower requirements by occupation is affected by making different assumptions about the distribution of the growth of employment.

It cannot be over-emphasized that a different set of projections may be obtained by adopting a different method, or by using more reliable data, or by making a different set of assumptions about the future course of events. The numbers of persons projected in each occupation provide only broad and conditional indications of occupational requirements.

Our regional projections have been obtained, because of data limitations, by assuming that the occupation structure of an industry for each region will change at the same rate as for Canada. Once again, this assumption is not completely realistic, especially in those cases in which the regional and national occupation structure differ markedly. Moreover, the method assumes implicitly that existing regional disparities will remain fairly constant over the future.

In assessing this study, we should also keep in mind two further points on the method adopted here. Firstly, our manpower requirements projections are made independently of the possible availability of manpower resources; the projections are determined by the industrial structure of employment and the occupation structure of industries, and are not influenced in any way by a restraint on the occupational resources available in 1975. For some occupations, this constraint can be quite important: for example, institutional or legal restriction may limit the level of employment of physicians and surgeons. Clearly, further research is needed to investigate the interdependence between the occupational resources available and the determination of occupational requirements.

Secondly, the data we have used on the occupation structure, the labour productivity and the output of industries are ex-post realizations and not ex-ante demand. Moreover, the data contain cyclical and other shorter-run disequilibrium components. The method adopted here does not allow us to disentangle the demand side from this realizations data, and so our projections are only 'requirements' projections. Furthermore, due to the problem of identifying the potential growth of the economy

and the equilibrium occupation structure in our past data, although we have projected modified trends in this data, our projections may well extrapolate present disequilibria into the future. They do not therefore represent an optimal distribution of manpower requirements.

Nevertheless, certain general conclusions can be drawn about the uses of the projections. The projections in all occupations have been made simultaneously. They are therefore consistent with one another since the projection in any one occupation depends on the projections in all other occupations. With the constraint that the projected total manpower requirements should equal the projected labour force less the projected level of unemployment, the projection in any occupation can only be increased with a corresponding change in other occupations. This is one of the important advantages of the method adopted here.

These projections provide an important input for efficient manpower planning. They give us a broad framework in which other projections may be made using techniques which are more appropriate for individual occupations. For example, a projection could be made for motor vehicle mechanics and repairmen by estimating their dependence on such factors as the number and age structure of motor vehicles, patterns of scrapping, income, and other significant variables. This projection could then be compared with the projection made here and, if large differences existed, further investigation would indicate the reasons for the discrepancy and hence determine the appropriate projection to be used for planning purposes.

They may also be used to provide some indication of future educational requirements if we assume a basic educational requirements structure for each occupation. Attempts have been made to transform occupational requirements to educational requirements using both existing data on the education structure of occupations and a desired education structure for each occupation (40 and 44); but neither method has yet proved to be completely satisfactory (23). Formal education is only one of the characteristics which are necessary for the efficient performance of the work functions in any given job, and we clearly need to know more about these other characteristics and their interrelationships before education requirements can be satisfactorily determined.

Besides these manpower requirements projections, we have also made projections of required manpower inflow. Given our assumptions about the growth of final demand, its structure, and the occupation structure of industries, these required manpower inflows indicate the manpower gap

which must be filled between the base year and the projection year in each occupation, if all the survivors in each occupation remain in this same occupation. There are several ways in which this gap may be filled, (see page 140) and it is important to note that the required manpower inflow may be met from one or all of these potential sources of manpower. The inflow cannot simply be equated with the immigration flows or the additions to be provided by educational or training institutions. It is quite possible that the manpower gap in an occupation may be completely filled by the working of the labour market without the need for policy intervention.

At present our knowledge of the working of the labour market and hence about the potential manpower available from the various sources is incomplete. There is therefore clearly a risk that intervention may occur when it is not needed, or that policy measures may be inadequate. Thus, there may be over- or under-adjustment, and manpower gaps may still appear in the future. The development of more reliable and appropriate indicators of current occupation shortages and surpluses thus becomes important in detecting at a fairly early stage those occupations in which maladjustment is taking place so that the necessary corrective action may be taken.

However, by studying the results of required manpower inflow (Table 7.5 for the major occupations and Appendix Table II.1 for the detailed occupation classes), certain conclusions are suggested. There are three types of occupations: those where the required manpower inflow is positive in all regions, those where the required manpower inflow is negative in all regions, and those where it is positive in some regions and negative in others.

If there is a negative inflow (i.e. an outflow) in any occupation for each region, this indicates that regional transfers of manpower will not help at all, as long as these transfers are not across occupations at the same time. In the case of 'baby sitters n.e.s.', 'railroad operators', 'fishermen, trappers and hunters', and 'spinners', there is a net required outflow in all regions between 1961 and 1975. If our assumption (that the 1975 survivors of the 1961 labour force in any occupation remain in the same occupation) is a valid one, then a net outflow for an occupation in all regions indicates the need for retraining the surplus in that occupation, but no need for regional transfers within the same occupation. Even if this assumption does not hold, and a spontaneous outflow of the 1961 labour force over and above the one calculated (in Appendix Table IV) does occur from such occupations,

one can still safely conclude that no regional transfers are indicated. Relaxation of the assumption implies that even retraining may not be essential to help shift people out of this occupation. Moreover, new entrants to the labour force should be advised to choose other occupations besides these.

For the following occupations, the required manpower inflow is positive in some regions and negative in others:

- (i) 'Telegraph operators', where in the Atlantic an outflow is indicated while for Ontario, the Prairies and British Columbia an inflow is required which is greater than or equal to the outflow in the Atlantic.
- (ii) 'Farmers and farm workers', where in British Columbia an inflow is indicated while for the other regions an outflow is indicated, which however, is greater than the inflow required in British Columbia. However, considering a more detailed occupation breakdown for this division, we notice that for (a) the farm managers occupation class, an inflow is indicated in all regions, while for (b) farm labourers an inflow is indicated only in British Columbia.
- (iii) 'Loggers and related workers', where an inflow is required in the Prairies and British Columbia which is less than the outflow indicated.
- (iv) 'Millwrights', where in the Atlantic an outflow is indicated which is however greater than the inflow required in all other regions.
- (v) and (vi) 'Longshoremen', and 'Sectionmen', where an inflow is required in British Columbia which, however, is less than the outflow required in all other regions.

For all these occupations, regional mobility programs can play a valuable role in meeting the required manpower inflow. Of course, it is possible that other flows (immigration, new entrants to the labour force, and flows from other occupations) will also help in meeting the required

inflow; but regional movements should not be ruled out. For example, the requirements for telegraph operators in Ontario, Prairies and British Columbia might be met by a movement of telegraph operators from the Atlantic Region.

For all other occupations, the required manpower inflow is positive in all regions. In these cases, any program to move people from one region to another will only improve matters in that region at the expense of the others. Therefore, other types of flows (immigration, retraining, new entrants to the labour force, and flows from other occupations) must be relied on to help meet these required inflows. Some of these other flows (retraining) are susceptible to public influence, while others (immigration, new entrants to the labour force, and flows from other occupations) can only be influenced indirectly.

While our study does not, nor was intended to, examine the relative importance of these flows in meeting the required manpower inflow projections for 1975, existing information on flows between occupations and between the educational system and occupations can be brought to bear in using the projections. One can, for example, classify occupations into those which can be entered easily by people working in other occupations (e.g. labourers, farm workers), and those (e.g. physicians and surgeons, engineers) where the main flow into an occupation, besides immigration, is through the education pipeline. Thus one can assess in further detail the relative roles the various flows can play in meeting the required manpower inflow projections. Finally, information can also be organized to assess the occupations that new entrants to the labour force, fresh from leaving the education system, are likely to take up in each year up to 1975.

Thus, we have indicated some of the important ways in which these projections can be used, with the help of other information on occupational mobility and education-occupation flows, and with the help of more reliable and appropriate indicators of current occupational shortages and surpluses.

The main purpose of this study was to provide projections of manpower requirements by detailed occupation for Canada and for each of the five economic regions. This was the dominant reason for adopting the particular method, though both our time constraint and data limitations were also important considerations. The method may not therefore be suitable for obtaining projections in more geographic or occupational detail: it is likely that the greater the degree of disaggregation, the greater the sensitivity of the projections to alternative

assumptions, and it may not be valid to carry the disaggregation further. For very small areas, because of the small numbers involved, a different investment decision by only one firm may be sufficient to generate relatively large changes in the projections of manpower requirements. Similarly, the effects of the errors in existing data may yield extremely unreliable results. Until further research and experimentation indicate the geographic-economic size of areas for which useful projections can be made, it seems reasonable that decisions should be made for small areas by giving due consideration to the projections for the region as a whole. Of course, the regional projections cannot really form the only basis for decision making: special circumstances may indicate the need for intensive study of special occupations and industries which dominate the local labour market.

SELECT BIBLIOGRAPHY

1. Ahamad, B., Historical Statistics of the Canadian Labour Force Classified by Occupation and Industry, Department of Manpower and Immigration (to be published).
2. Alterman, Jack, The Use of Input-Output Models in Economic Projections and Manpower Analysis by the Federal Interagency Growth Project in the United States. Paper presented to the Fourth International Conference on Input-Output techniques, Geneva, 1968 (mimeo).
3. Atlantic Provinces Economic Council, Agriculture and the Atlantic Economy, Pamphlet No. 10, July 1966.
4. Atlantic Provinces Economic Council, Atlantic Provinces Fishery, Pamphlet No. 12, June 1968.
5. Bertram, Gordon W., The Contribution of Education to Economic Growth, Economic Council of Canada, Staff Study No. 12, Queen's Printer, 1966.
6. Brewis, T. N., Regional Economic Policies in Canada, Toronto, Macmillan, 1968.
7. Campbell, Duncan R. and Edward B. Power, Manpower Implications of Prospective Technological Changes in the Eastern Canadian Pulpwood Logging Industry, Department of Manpower and Immigration, Research Monograph No. 1, Ottawa, Queen's Printer, 1966.

8. Caves, Richard E. and Richard H. Holton, The Canadian Economy - Prospect and Retrospect. Cambridge, Harvard University Press, 1959.
9. Denison, Edward F., The Sources of Economic Growth in the United States and the Alternatives Before Us, Supplementary Paper No. 13, New York, Committee for Economic Development, 1962.
10. Denton, Frank T. and Sylvia Ostry, Historical Estimates of the Canadian Labour Force, Dominion Bureau of Statistics, 1961 Census Monograph, Ottawa, Queen's Printer, 1967.
11. Dominion Bureau of Statistics, Occupation and Industry Trends, 1961, Census Bulletin, SL-1, Catalogue No. 94-551.
12. Dominion Bureau of Statistics, Labour Force, Catalogue No. 71-001.
13. Dominion Bureau of Statistics, Canadian Labour Force Survey, (Methodology), Catalogue No. 71-504.
14. Dominion Bureau of Statistics, Review of Employment and Payrolls, Catalogue No. 72-201.
15. Dominion Bureau of Statistics, Estimates of Employees by Province and Industry, 1961-64, Catalogue No. 72-503.
16. Dominion Bureau of Statistics, Estimates of Employees by Province and Industry, Catalogue No. 72-008.
17. Dominion Bureau of Statistics, Indexes of Real Domestic Product by Industry of Origin, 1935-1961, Catalogue No. 61-505.
18. Dominion Bureau of Statistics, Indexes of Real Domestic Product by Industry, (1961 Base), Catalogue No. 61-506.

19. Dominion Bureau of Statistics, Indexes of Output per Person Employed and Per Man-Hour in Canada: Commercial Non-Agricultural Industries, 1947-1963, Catalogue No. 14-501.
20. Dominion Bureau of Statistics, Comparison of Labour Force Survey and Estimates of Employees, Paid Worker Series, Working Paper No. 8000-501.
21. Dominion Bureau of Statistics, 1966 Census Volume III - Agriculture, Catalogue No. 96-601.
22. Dominion Bureau of Statistics, Canada Year Book, 1968, Ottawa, Queen's Printer, 1968.
23. Dominion Bureau of Statistics, The Input-Output Structure of the Canadian Economy, 1961 (Volume I), Catalogue No. 15-501.
24. Economic Council of Canada, First Annual Review, Ottawa, Queen's Printer, 1964.
25. Economic Council of Canada, Second Annual Review, Ottawa, Queen's Printer, 1965.
26. Economic Council of Canada, Third Annual Review, Ottawa, Queen's Printer, 1966.
27. Economic Council of Canada, Fourth Annual Review, Ottawa, Queen's Printer, 1967.
28. Economic Council of Canada, Fifth Annual Review, Ottawa, Queen's Printer, 1968.
29. Firestone, O. J., Canada's Economic Development 1867-1953, London, Bowes and Bowes, 1958.

30. Firestone, O. J., Education and Economic Development - The Canadian Case, Paper presented at the Tenth General Conference of the International Association for Research in Income and Wealth, Ireland, 1967 (mimeo).
31. George, M. V. and K. S. Gnanasekaran, 1966 Census Data and Recent Population Projections for Canada. Technical Memorandum, Population Estimates and Projections Series No. 2, Ottawa, Dominion Bureau of Statistics, 1968.
32. Goldstein, H. and S. Swerdloff, Methods of Long-Term Projections of Requirements for and Supply of Qualified Manpower, Paris, UNESCO, 1967.
33. Hollister, Robinson, A Technical Evaluation of the First Stage of the Mediterranean Regional Project, Paris, OECD, 1966.
34. Hood, William C. and Anthony Scott, Output, Labour and Capital in the Canadian Economy, Royal Commission on Canada's Economic Prospects, Ottawa, Queen's Printer, 1957.
35. Illing, W. M., M. V. George, Y. Kasahara and F. T. Denton, Population, Family, Household and Labour Force Growth to 1980, Economic Council of Canada, Staff Study No. 19, Ottawa, Queen's Printer, 1967.
36. Judek, Stanislaw, Medical Manpower in Canada, Royal Commission on Health Services, Ottawa, Queen's Printer, 1964.
37. Kendrick, John W., Productivity Trends in the United States, National Bureau of Economic Research, New York, Princeton University Press, 1961.
38. MacFarlane, Bruce A., Dental Manpower in Canada, Royal Commission on Health Services, Ottawa, Queen's Printer, 1964.

39. Meltz, Noah M., Changes in the Occupational Composition of the Canadian Labour Force, 1931-1961, Occasional Paper No. 2, Economics and Research Branch, Department of Labour, Ottawa, Queen's Printer, 1965.
40. Meltz, Noah M., Manpower in Canada, 1931-1961: Historical Statistics of the Canadian Labour Force, Department of Manpower and Immigration, Ottawa, Queen's Printer, 1969.
41. Meltz, Noah M. and G. Peter Penz, Canada's Manpower Requirements in 1970, Department of Manpower and Immigration, Ottawa, Queen's Printer, 1968.
42. O.E.C.D., The Residual Factor and Economic Growth, Paris, 1969.
43. Ostry, Sylvia, The Occupational Composition of the Canadian Labour Force, Dominion Bureau of Statistics, 1961 Census Monograph, Ottawa, Queen's Printer, 1967.
44. Parnes, Herbert S., Forecasting Educational Needs for Economic and Social Development, Paris, OECD, 1962.
45. Perkins, Brian B., Projections of Annual Employment in Canadian Agriculture, 1966-71, 1976 and 1981. A report to the Minister of Manpower and Immigration, Department of Agriculture Economics, University of Guelph, 1967 (unpublished).
46. United States Department of Labour, Bureau of Labour Statistics, Tommorow's Manpower Needs, (Volumes I to IV), Bulletin No. 1606, Washington, U.S. Government Printing Office, 1969.
47. Upex, F. D., Manpower Requirements in the Construction Industry, Department of Manpower and Immigration, 1968 (unpublished).

APPENDIX TABLES

- I.1 - PROJECTED MANPOWER REQUIREMENTS BY OCCUPATION CLASS BY REGION, 1975
- I.2 - DISTRIBUTIONS OF PROJECTED MANPOWER REQUIREMENTS BY OCCUPATION CLASS BY REGION, 1975
- II.1 - REQUIRED MANPOWER INFLOW BY OCCUPATION CLASS BY REGION, 1961-75
- II.2 - REQUIRED MANPOWER INFLOW, 1961-75, AS A PROPORTION OF PROJECTED MANPOWER REQUIREMENTS BY OCCUPATION CLASS BY REGION, 1975
- III - PROJECTED COEFFICIENTS OF EMPLOYMENT CONCENTRATION FOR EACH OCCUPATION CLASS BY INDUSTRY DIVISION
- IV - ESTIMATED NUMBER OF SURVIVORS OF THE 1961 LABOUR FORCE IN 1975 BY OCCUPATION CLASS BY REGION
- V - PROJECTED DISTRIBUTION OF EMPLOYMENT BY OCCUPATION CLASS FOR EACH INDUSTRY DIVISION, CANADA, 1975

PROJECTED MANPOWER REQUIREMENTS BY

	SENSI- TIVITY CODE	ATLANTIC		QUEBEC	
		Alt. 1	Alt. 2	Alt. 1	Alt. 2
<u>MANAGERIAL OCCUPATIONS</u>	A	49.4	51.1	205.8	209.8
<u>PROFESSIONAL AND TECHNICAL OCCUPATIONS</u>	B	89.0	95.2	404.0	416.4
PROFESSIONAL ENGINEERS	B	4.9	4.9	28.4	28.4
Civil (incl. surveyors)	B	2.8	2.8	11.0	11.2
Mechanical	D	0.9	0.8	7.1	7.0
Mechanical	D	0.7	0.7	4.9	4.8
Industrial	D	0.2	0.2	2.2	2.2
Electrical	B	0.7	0.7	4.8	4.8
Chemical	D	0.1	0.1	1.4	1.3
BIOLOGISTS AND AGRICULTURAL PROFESSIONALS	B	0.9	0.8	3.5	3.5
Veterinarians	D	0.1	0.1	0.4	0.4
TEACHERS	C	35.5	38.8	138.3	144.5
Professors	E	1.7	1.9	14.7	15.3
School Teachers	C	32.0	35.0	113.4	118.6
HEALTH PROFESSIONALS	C	22.7	24.7	79.4	82.7
Physicians & Surgeons	E	2.5	2.7	13.5	14.1
Dentists	E	0.5	0.5	2.3	2.4
Nurses, Graduate	C	10.8	11.7	30.3	31.5
Nurses-in-Training	E	4.5	5.0	14.5	15.2
Osteopaths	E	0.1	0.1	0.6	0.6
Medical & D. Technicians	E	3.3	3.6	13.6	14.0

TABLE I.1

OCCUPATION CLASS BY REGION, 1975

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
306.3	305.6	122.2	123.7	79.8	82.2	763.7	772.6
516.5	521.6	223.2	237.1	132.4	136.0	1,366.8	1,397.5
48.1	47.1	14.5	14.2	10.3	10.2	105.5	104.3
15.2	15.3	8.0	8.0	5.7	5.7	42.4	42.9
14.2	13.7	1.8	1.8	1.6	1.7	25.4	24.7
9.0	8.7	1.3	1.2	1.2	1.2	17.1	16.6
5.2	5.0	0.6	0.5	0.4	0.4	8.5	8.2
7.9	7.7	1.1	1.1	0.9	0.9	15.3	15.0
2.9	2.8	0.6	0.5	0.4	0.4	5.4	5.1
4.4	4.4	3.7	3.7	1.2	1.2	13.8	13.6
0.8	0.7	0.5	0.4	0.2	0.2	1.9	1.8
131.5	135.1	74.2	76.8	36.7	38.2	415.2	431.8
8.2	8.5	3.5	3.7	2.2	2.3	30.1	31.3
117.7	120.9	67.2	69.5	32.9	34.3	362.4	376.9
120.0	123.0	58.0	59.9	36.1	37.6	316.2	327.8
16.6	17.1	6.9	7.2	4.8	5.0	44.2	45.9
3.9	4.0	1.5	1.5	1.2	1.2	9.4	9.7
56.0	57.5	25.8	26.6	17.6	18.3	141.0	146.4
16.4	16.8	9.3	9.6	4.5	4.7	49.6	51.6
1.2	1.2	0.5	0.5	0.3	0.4	2.7	2.8
18.5	18.7	10.9	11.2	5.4	5.5	51.8	53.1

APPENDIX TABLE I.1 (Cont'd)

	SENSI- TIVITY CODE	ATLANTIC		QUEBEC	
		Alt. 1	Alt. 2	Alt. 1	Alt. 2
LAW PROFESSIONALS	E	1.0	1.1	6.5	6.8
Judges & Magistrates	E	0.1	0.1	0.2	0.2
Lawyers & Notaries	E	0.9	1.0	6.3	6.5
RELIGION PROFESSIONALS	C	5.0	5.4	25.1	26.3
Clergymen, n.o.r.	E	3.3	3.6	10.1	10.6
Nuns & Brothers, n.o.r.	E	1.3	1.4	11.8	12.3
ARTISTS, WRITERS AND MUSICIANS	D	2.5	2.6	17.9	18.4
Artists & Art Teachers	D	0.3	0.3	4.6	4.7
Commercial	B	0.1	0.1	2.3	2.3
Except Commercial	E	0.2	0.2	2.3	2.4
Authors	B	1.2	1.2	7.8	8.0
Musicians	E	1.0	1.1	5.5	5.7
OTHER PROFESSIONALS	A	16.6	16.9	104.9	106.0
Architects	E	0.3	0.3	3.2	3.4
Draughtsmen	B	1.3	1.2	7.9	7.9
Actuaries	B	0.2	0.2	2.8	2.8
Librarians	D	0.4	0.5	1.7	1.8
Interior Decorators	D	0.4	0.4	2.3	2.4
Photographers	D	0.2	0.3	2.0	2.0
<u>CLERICAL OCCUPATIONS</u>	A	73.0	75.9	369.3	378.6
Office Appliance Oper.	B	2.8	2.9	25.0	25.5
Shipping & R. Clerks	C	3.2	3.3	20.4	20.2
Baggagemen, Transport	E	0.1	0.2	0.5	0.6

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
8.9	9.1	3.6	3.7	2.5	2.6	22.3	23.1
0.3	0.3	0.2	0.2	0.1	0.1	0.9	0.9
8.6	8.9	3.4	3.5	2.4	2.5	21.4	22.2
16.3	16.7	8.6	8.9	3.3	3.4	58.2	60.6
11.1	11.4	6.4	6.6	2.6	2.7	33.8	35.2
3.6	3.7	1.2	1.3	0.2	0.2	18.0	18.7
26.9	27.1	7.7	7.9	5.7	5.9	60.3	61.5
7.4	7.4	1.5	1.5	1.3	1.4	14.8	15.0
5.0	5.0	1.0	0.9	0.6	0.7	8.9	8.9
2.4	2.4	0.5	0.5	0.7	0.7	6.0	6.2
12.1	12.1	3.4	3.4	2.5	2.6	26.9	27.1
7.4	7.6	2.9	3.0	1.9	2.0	18.6	19.4
160.4	159.0	52.8	52.1	36.6	36.9	375.2	374.8
3.9	4.0	1.5	1.5	1.2	1.3	10.0	10.3
16.3	16.0	4.9	4.8	3.2	3.2	33.5	33.1
4.9	4.8	0.7	0.7	0.4	0.4	8.9	9.0
3.8	3.9	1.1	1.2	0.9	0.9	7.9	8.2
4.1	4.2	1.2	1.2	0.9	1.0	7.5	7.8
2.7	2.7	0.9	0.9	0.7	0.7	6.4	6.6
575.8	578.2	202.0	207.1	123.4	128.6	1,340.6	1,366.0
57.8	57.6	18.1	18.5	9.9	10.4	113.3	114.7
38.6	37.6	9.8	9.7	5.4	5.5	76.7	75.6
0.6	0.6	0.5	0.5	0.1	0.1	1.9	2.0

APPENDIX TABLE I.1 (Cont'd)

	SENSI- TIVITY CODE	ATLANTIC		QUEBEC	
		Alt. 1	Alt. 2	Alt. 1	Alt. 2
Ticket Agents, Transport	E	0.8	0.9	1.9	2.1
Stenographers	A	21.0	21.8	105.0	107.6
Stenographers	A	17.5	18.3	85.2	87.3
Typists	B	3.4	3.6	19.8	20.2
Attendants, D. & D. Off.	E	0.3	0.3	0.9	1.0
<u>SALES OCCUPATIONS</u>	B	39.1	41.5	158.6	163.6
Foremen, Trade	E	0.7	0.7	4.1	4.3
Auctioneers	E	0.0	0.0	0.0	0.0
Canvassers	B	1.3	1.3	4.7	4.8
Sales Clerks	B	29.6	31.8	93.6	97.7
Sales Clerks	C	25.1	26.9	82.2	85.7
Service Station Att.	C	4.5	4.9	11.4	12.0
Advertising Salesmen	D	0.4	0.4	2.0	2.0
Insurance Salesmen	C	1.9	2.0	10.9	11.5
Real Estate Salesmen	C	0.3	0.3	3.5	3.7
Security Salesmen	E	0.2	0.2	1.5	1.6
Brokers, nes	B	0.6	0.6	2.7	2.8
<u>SERVICE AND RECREATION OCCUPATIONS</u>	B	84.0	90.0	348.7	361.7
PROTECTIVE SERVICE OCCUPATIONS	C	9.6	9.6	48.5	48.8
Firemen, Fire Protection	C	2.1	2.1	7.3	7.3
Policemen & Detectives	C	3.3	3.2	20.8	21.0
Guards, Watchmen, nes	B	4.2	4.3	20.4	20.6

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
3.0	3.2	2.2	2.4	1.2	1.3	9.1	9.9
175.9	176.7	60.5	61.6	38.5	40.0	401.2	408.2
131.1	131.8	47.6	48.4	31.6	32.8	313.4	318.9
44.8	44.9	12.9	13.2	6.9	7.2	87.8	89.3
3.4	3.5	1.4	1.4	1.5	1.5	7.5	7.7
237.0	238.5	92.3	95.6	57.7	61.1	585.6	601.2
8.5	8.6	2.6	2.7	1.1	1.2	16.7	17.3
0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.3
7.6	7.4	3.3	3.3	2.0	2.1	19.0	19.0
133.5	135.8	57.1	59.9	35.3	37.6	351.0	364.5
109.5	111.3	47.0	49.2	29.0	30.8	294.0	304.9
24.0	24.5	10.1	10.7	6.3	6.8	57.0	59.6
4.2	4.2	1.2	1.2	0.8	0.8	8.5	8.5
13.9	14.3	4.5	4.7	2.9	3.2	33.9	35.6
9.1	9.4	3.1	3.3	3.6	4.1	20.0	21.0
2.5	2.6	0.7	0.8	0.7	0.8	5.8	6.1
4.9	5.0	2.5	2.5	1.4	1.4	11.9	12.2
460.8	470.5	204.4	210.3	125.6	130.2	1,222.1	1,261.4
45.5	45.4	18.7	18.5	12.3	12.4	132.4	132.4
8.0	7.9	4.3	4.2	2.7	2.7	24.1	24.0
16.3	16.3	8.0	8.0	4.3	4.4	50.9	51.0
21.2	21.1	6.4	6.4	5.3	5.4	57.3	57.4

APPENDIX TABLE I.1 (Cont'd)

	SENSI- TIVITY CODE	ATLANTIC		QUEBEC	
		Alt. 1	Alt. 2	Alt. 1	Alt. 2
HOUSEKEEPERS, WAITERS, COOKS AND RELATED WORKERS	B	49.8	54.1	184.3	192.5
Housekeepers	E	2.3	2.5	8.3	8.8
Cooks	C	5.9	6.3	30.0	31.3
Waiters	C	8.7	9.4	44.2	46.2
Waiters & Waitresses	C	8.1	8.8	39.1	40.9
Bartenders	E	0.5	0.6	5.1	5.3
Nursing Assistants & Aides	C	14.9	16.3	49.1	51.3
Porters, Baggage & Pullman	D	0.5	0.5	1.6	1.7
Baby Sitters, nes	C	12.9	14.0	33.5	34.9
Baby Sitters	E	0.4	0.4	1.3	1.4
Maids, nes	C	12.5	13.6	32.2	33.5
ATHLETES, ENTERTAINERS AND RELATED WORKERS	E	1.0	1.1	5.4	5.6
Actors	E	0.3	0.3	2.7	2.8
Athletes & Sports Offils.	E	0.7	0.8	2.7	2.8
OTHER SERVICE OCCUPATIONS	C	23.5	25.2	110.5	114.8
Barbers, Hairdrs., Manic.	E	2.8	3.1	13.7	14.3
Launderers & Dry Cleaners	C	4.8	5.2	20.2	21.1
Elevator Tenders, Bldg.	B	0.4	0.4	3.0	3.1
Janitors & Cleaners, Bldg.	C	14.0	14.9	65.4	67.7
Funeral Dir. & Embalmers	E	0.4	0.4	1.1	1.1
Guides	E	0.3	0.3	1.5	1.5
<u>TRANSPORT AND COMMUNICATION OCCUPATIONS</u>	A	46.0	46.9	161.7	167.7
AIR PILOTS, NAVIGATORS AND FLIGHT ENGINEERS	E	0.2	0.3	2.2	2.4

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
240.9	247.3	112.4	116.1	71.0	73.8	662.0	687.2
11.7	12.0	5.7	5.9	3.9	4.1	32.0	33.4
29.8	30.6	17.1	17.5	11.9	12.2	94.4	97.6
56.2	57.6	26.8	27.7	17.3	18.1	151.9	157.8
50.8	52.1	22.8	23.6	14.8	15.4	134.6	139.8
5.4	5.5	4.0	4.1	2.5	2.6	17.4	18.0
79.5	81.7	38.2	39.5	23.8	24.8	206.5	214.6
2.2	2.3	1.2	1.2	0.5	0.5	6.0	6.4
37.7	38.7	17.6	18.1	10.7	11.0	111.6	115.5
3.8	3.9	2.4	2.4	1.2	1.3	9.0	9.4
34.0	34.8	15.3	15.7	9.5	9.8	102.6	106.2
7.9	8.2	2.2	2.3	2.3	2.4	18.7	19.5
3.0	3.1	0.7	0.7	1.0	1.0	7.6	8.0
5.0	5.1	1.5	1.5	1.4	1.4	11.2	11.6
166.4	169.7	71.2	73.4	39.8	41.5	408.9	422.2
18.7	19.2	6.9	7.1	3.9	4.1	46.2	48.0
27.9	28.7	12.2	12.6	7.4	7.7	72.6	75.4
2.9	2.9	1.0	1.0	0.7	0.8	7.9	8.1
105.1	106.7	47.4	48.8	25.7	26.8	257.5	265.0
1.9	2.0	0.7	0.7	0.4	0.4	4.5	4.7
2.6	2.6	0.4	0.4	0.2	0.2	4.9	5.1
194.6	196.9	80.4	82.9	52.4	53.8	533.3	546.2
2.0	2.1	1.3	1.4	2.0	2.1	7.6	8.3

APPENDIX TABLE I.1 (Cont'd)

	SENSI- TIVITY CODE	ATLANTIC		QUEBEC	
		Alt. 1	Alt. 2	Alt. 1	Alt. 2
OPERATORS, RAILROAD	C	1.8	1.9	2.9	3.1
Locomotive Engineers	D	0.5	0.5	0.7	0.7
Locomotive Firemen	E	0.1	0.1	0.2	0.3
Conductors, Railroad	E	0.3	0.3	0.6	0.7
Brakemen, Switch. & Sig.	E	0.9	0.9	1.3	1.5
OPERATORS, WATER TRANSPORT	D	4.1	4.1	4.2	4.4
Deck & Engrg. Off., Ship	D	1.6	1.6	1.7	1.9
Deck Ratings (ship)	D	1.9	1.9	1.9	2.0
Engine-room Ratings, Ship	D	0.6	0.7	0.5	0.6
OPERATORS, ROAD TRANSPORT	A	31.4	31.9	121.6	125.0
Bus Drivers	C	4.4	4.8	9.8	10.8
Taxi Drivers & Chauffeurs	C	2.2	2.3	11.1	12.1
OTHER TRANSPORT OCCUPATIONS	D	1.5	1.5	3.9	4.2
Operators, E. S. Railway	E	0.0	0.0	0.0	0.0
OTHER COMMUNICATION OCCUPATIONS	C	6.9	7.3	26.9	28.5
Radio & TV Announcers	E	0.4	0.4	0.8	0.9
Telephone Operators	A	3.7	3.9	16.7	17.4
Telegraph Operators	E	0.4	0.4	0.9	0.9
Postmen & Mail Carriers	C	1.3	1.4	3.6	4.0
<u>FARMERS AND FARM WORKERS</u>	B	21.4	16.4	84.6	77.7
Farmers & Stockraisers	B	10.2	7.3	40.4	36.6

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
6.1	6.4	3.4	3.7	1.5	1.6	15.5	16.5
1.8	1.8	0.9	1.0	0.4	0.4	4.2	4.4
0.6	0.6	0.3	0.3	0.2	0.2	1.5	1.6
1.3	1.4	0.7	0.7	0.3	0.3	3.2	3.4
2.5	2.6	1.5	1.6	0.6	0.6	6.6	7.1
3.8	3.9	0.4	0.4	4.2	4.3	17.1	17.6
1.4	1.4	0.1	0.1	2.3	2.3	7.1	7.4
1.8	1.8	0.3	0.3	1.6	1.6	7.6	7.8
0.6	0.7	0.0	0.0	0.3	0.4	2.3	2.4
142.3	142.7	58.2	59.2	34.6	35.2	388.4	393.8
9.5	10.0	8.8	9.4	4.6	4.8	37.7	40.2
7.5	7.8	2.1	2.3	1.7	1.8	24.5	26.1
6.4	6.6	2.6	2.8	1.8	1.8	16.3	17.1
0.8	0.8	0.0	0.0	0.0	0.0	0.8	0.9
34.0	35.2	14.5	15.4	8.3	8.8	88.5	93.0
1.2	1.2	0.8	0.8	0.3	0.4	3.4	3.7
23.0	23.5	9.4	9.9	4.9	5.1	56.7	59.0
1.1	1.1	0.6	0.7	0.4	0.4	3.3	3.6
5.6	6.0	2.0	2.2	1.6	1.7	14.1	15.3
126.4	114.7	199.4	171.0	25.7	23.6	457.7	403.8
58.1	51.6	119.2	101.3	9.8	8.7	237.1	205.5

APPENDIX TABLE I.1 (Cont'd)

	SENSI- TIVITY CODE	ATLANTIC		QUEBEC	
		Alt. 1	Alt. 2	Alt. 1	Alt. 2
Farm Managers & Foremen	D	0.3	0.2	0.4	0.4
Farm Labourers	B	7.9	5.9	33.2	30.3
Gardeners (exc. farm)	B	3.0	2.9	10.5	10.4
Gardeners (exc. farm)	B	2.5	2.5	8.9	8.9
Other Agricultural Occ.	C	0.5	0.4	1.6	1.5
<u>LOGGERS AND RELATED WORKERS</u>	B	8.8	8.0	14.1	12.6
Forest Rangers & Cruisers	C	0.9	0.9	2.6	2.4
<u>FISHERMEN, TRAPPERS AND HUNTERS</u>	B	18.2	12.3	0.8	0.7
Fishermen	B	18.2	12.3	0.7	0.5
Trappers & Hunters	C	0.0	0.0	0.1	0.1
<u>MINERS, QUARRYMEN AND PROCESS AND RELATED WORKERS</u>	B	10.3	9.5	11.3	10.4
Prospectors	E	0.0	0.0	0.2	0.2
<u>CRAFTSMEN, PRODUCTION PROCESS AND RELATED WORKERS</u>	A	151.0	146.6	634.3	618.8
MILLERS, BAKERS, BREWERS AND RELATED FOOD WORKERS	C	18.4	17.2	35.2	34.6
Millers of Flour & Grain	E	0.1	0.1	1.0	1.0
Fruit & Veg. Canners	E	0.3	0.3	1.0	0.9

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
1.4	1.3	1.1	1.0	0.6	0.6	3.7	3.3
47.3	42.4	67.1	57.3	8.9	7.9	165.1	144.1
19.7	19.4	12.0	11.4	6.5	6.5	51.9	50.8
15.9	15.9	7.7	7.7	5.6	5.6	40.7	40.8
3.9	3.5	4.3	3.8	0.9	0.8	11.2	10.0
7.5	6.8	6.8	4.2	11.9	10.6	50.8	43.9
2.1	1.9	4.5	2.8	2.3	2.0	11.7	10.1
0.8	0.7	2.0	1.5	3.2	2.8	24.6	17.9
0.7	0.6	1.1	0.8	3.1	2.8	23.2	16.9
0.1	0.1	0.9	0.7	0.0	0.0	1.4	1.0
21.1	17.8	12.6	11.2	6.1	5.3	59.4	52.5
0.2	0.2	0.1	0.1	0.2	0.2	0.7	0.6
919.0	887.5	288.7	279.3	200.5	195.9	2,198.9	2,133.4
46.2	44.5	16.2	15.4	10.4	10.2	129.3	125.1
1.4	1.3	0.5	0.5	0.1	0.1	3.1	2.9
5.9	5.6	0.4	0.4	1.4	1.3	8.8	8.3

APPENDIX TABLE I.1 (Cont'd)

	SENSI- TIVITY CODE	ATLANTIC		QUEBEC	
		Alt. 1	Alt. 2	Alt. 1	Alt. 2
TIRE BUILDERS, VULCANIZERS AND OTHER RUBBER WORKERS	D	0.2	0.2	3.6	3.5
Tire & Tube Builders	D	0.0	0.0	0.2	0.2
Vulcanizers	D	0.2	0.2	0.8	0.8
LEATHER CUTTERS, LASTERS, SEWERS AND OTHER LEATHER WORKERS (EXCEPT GLOVE AND GARMENT)	E	0.6	0.6	16.1	15.4
Leather Cutters	E	0.1	0.0	1.8	1.7
Shoemakers, Factory, nes	E	0.3	0.3	11.7	11.1
Shoemakers, Not in Factory	E	0.2	0.3	1.6	1.7
SPINNERS, WEAVERS, KNITTERS AND RELATED WORKERS	E	0.6	0.6	13.0	12.3
Weavers	E	0.1	0.1	1.9	1.9
TAILORS, FURRIERS, UPHOLST- ERERS AND RELATED WORKERS	C	3.3	3.3	72.2	69.7
Dressmakers Not in Factory	D	1.5	1.6	10.5	11.0
Upholsterers	E	0.2	0.2	2.1	2.0
CARPENTERS, CABINETMAKERS, SAWYERS AND RELATED WORKERS	A	21.8	20.7	56.8	54.7
Carpenters	C	17.2	16.4	38.0	36.7
Sawyers	E	2.3	2.2	4.1	3.9
Inspectors, Log & Lumber	D	0.5	0.5	2.5	2.4

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
8.4	8.1	1.1	1.1	0.6	0.7	13.7	13.4
2.3	2.2	0.2	0.2	0.1	0.1	2.6	2.6
1.6	1.6	0.7	0.8	0.5	0.5	3.8	3.8
13.5	12.9	1.2	1.2	0.6	0.6	32.7	31.3
1.3	1.3	0.1	0.1	0.0	0.0	3.3	3.2
9.8	9.3	0.2	0.2	0.1	0.1	22.8	21.5
1.4	1.4	0.8	0.8	0.5	0.5	4.4	4.6
8.6	8.1	0.2	0.2	0.2	0.2	23.4	22.1
0.9	0.9	0.0	0.0	0.0	0.0	3.2	3.0
45.6	43.9	14.9	14.2	5.2	5.2	144.3	139.1
8.3	8.5	3.4	3.6	2.3	2.5	25.5	26.4
4.0	3.8	1.1	1.0	0.6	0.6	7.9	7.6
61.0	58.6	27.7	25.8	34.1	32.6	203.3	194.1
39.5	38.1	22.6	21.1	13.6	13.0	131.2	125.5
4.0	3.8	1.1	1.0	7.9	7.5	20.1	19.1
1.4	1.3	0.3	0.2	4.2	4.0	9.1	8.6

APPENDIX TABLE I.1 (Cont'd)

	SENSI- TIVITY CODE	ATLANTIC		QUEBEC	
		Alt. 1	Alt. 2	Alt. 1	Alt. 2
PRINTERS, BOOKBINDERS AND RELATED WORKERS	C	2.3	2.1	19.5	18.7
Compositors & Typesetters	E	1.1	1.0	6.1	5.9
Photoengravers, Pressmen	E	0.8	0.7	9.1	8.7
Pressmen, Printing	E	0.6	0.6	6.5	6.2
Lithographic Occ.	E	0.1	0.1	1.9	1.8
Photoengravers	E	0.1	0.1	0.8	0.7
Bookbinders	E	0.2	0.2	2.5	2.4
Other Occ. in Bookbind.	E	0.1	0.1	0.5	0.5
Printing Workers, nes	E	0.1	0.1	1.3	1.2
FURNACEMEN, MOULDERS, BLACKSMITHS AND RELATED METAL WORKERS	E	1.9	1.8	10.3	9.9
Heat Treaters, Etc.	E	0.0	0.0	0.3	0.3
Rolling Mill Operators	E	0.3	0.2	0.5	0.5
Blacksmiths, Etc.	B	0.4	0.4	1.4	1.4
Coremakers	E	0.0	0.0	0.1	0.1
JEWELLERS, WATCHMAKERS AND ENGRAVERS	D	0.3	0.3	2.9	2.9
Engravers, Exc. Photoeng.	D	0.0	0.0	0.4	0.4
MACHINISTS, PLUMBERS, SHEET METAL WORKERS AND RELATED WORKERS	C	18.1	17.1	86.7	83.3
Toolmakers, Diemakers	E	0.1	0.1	2.3	2.2
Filers, Grinders, Etc.	D	0.2	0.2	1.2	1.1
Millwrights	D	1.2	1.1	3.1	2.9
Fitters & A., nes, Metal	E	0.6	0.6	3.8	3.6

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
36.6	34.8	7.4	6.8	4.2	4.0	68.9	65.5
10.8	10.3	3.0	2.8	1.6	1.5	22.4	21.3
17.7	16.8	2.9	2.6	1.8	1.7	31.8	30.1
11.2	10.6	2.2	2.0	1.2	1.1	21.5	20.4
4.7	4.4	0.5	0.5	0.5	0.5	7.4	7.1
1.8	1.7	0.2	0.2	0.1	0.1	2.9	2.7
3.3	3.1	0.7	0.7	0.4	0.4	6.9	6.6
1.9	1.8	0.4	0.4	0.2	0.2	3.0	2.9
3.0	2.8	0.3	0.3	0.2	0.2	4.8	4.6
21.6	20.5	3.1	2.9	3.1	3.0	39.7	37.7
1.4	1.3	0.0	0.0	0.1	0.1	1.7	1.6
3.1	3.0	0.3	0.3	0.1	0.1	4.1	3.9
1.5	1.5	0.7	0.7	0.3	0.3	4.4	4.3
0.7	0.7	0.1	0.1	0.0	0.0	0.9	0.8
3.0	3.0	0.8	0.8	0.6	0.6	7.5	7.6
0.6	0.5	0.1	0.1	0.1	0.0	1.2	1.1
183.6	175.1	37.7	35.7	27.1	25.9	350.6	334.5
12.4	11.7	0.3	0.2	0.2	0.2	14.6	13.9
5.4	5.1	0.4	0.4	0.9	0.9	7.8	7.5
8.5	8.0	1.1	1.0	3.2	3.0	17.1	16.1
19.4	18.4	0.7	0.7	0.5	0.5	24.1	22.8

APPENDIX TABLE I.1 (Cont'd)

	SENSI- TIVITY CODE	ATLANTIC		QUEBEC	
		Alt. 1	Alt. 2	Alt. 1	Alt. 2
Plumbers & Pipefitters	C	4.7	4.4	16.4	15.7
Sheet Metal Workers	C	1.2	1.1	5.9	5.6
Riveters & Rivet Heaters	D	0.1	0.1	0.6	0.5
Boilermakers, Etc.	B	1.9	1.8	4.2	3.9
Welders & Flame Cutters	C	4.9	4.7	23.9	23.2
Polishers & Buffers, Metal	E	0.0	0.0	0.7	0.6
MECHANICS AND REPAIRMEN, ELECTRICIANS AND RELATED ELECTRICAL AND ELECTRONICS WORKERS	A	34.7	35.3	137.5	138.9
Mechanics & R., Aircraft	B	0.8	0.8	6.6	6.7
Mechanics & R., Motor Veh.	C	9.7	10.3	40.8	42.6
Mechanics & R., Railroad	D	0.6	0.6	1.7	1.8
Power Station Operators	C	0.7	0.7	1.6	1.5
Projectionists, Mot. Pic.	E	0.1	0.2	0.6	0.6
Linemen	C	4.6	4.7	11.6	12.0
Fitters, nes	E	0.3	0.3	6.4	6.1
Fitters	E	0.2	0.2	5.5	5.2
Electrical Workers, nes	E	0.0	0.0	0.9	0.9
PAINTERS, PAPERHANGERS AND GLAZIERS	B	5.2	5.1	17.1	16.9
BRICKLAYERS, PLASTERERS AND CONSTRUCTION WORKERS, NES	C	8.4	8.1	33.0	31.6
General Foremen, Constn.	C	3.5	3.4	8.1	7.8
Inspectors, Construction	B	0.6	0.6	3.0	3.0
Bricklayers, Etc.	C	2.6	2.5	10.8	10.2
Bricklayers, Etc.	C	2.2	2.0	8.4	7.9
Cement and Concrete Fin.	D	0.5	0.4	2.4	2.3
Plasterers & Lathers	C	0.5	0.5	3.9	3.7

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
19.0	18.2	8.7	8.0	4.8	4.6	54.5	51.8
10.0	9.6	4.4	4.0	2.1	2.0	23.5	22.2
0.3	0.3	0.1	0.1	0.0	0.0	1.1	1.0
5.4	5.1	1.7	1.6	2.5	2.3	15.8	15.0
40.5	38.8	14.6	14.1	7.9	7.6	91.4	87.9
2.0	1.9	0.1	0.1	0.1	0.1	2.7	2.6
198.7	196.4	74.6	75.5	46.1	46.7	494.2	495.2
2.5	2.5	3.3	3.4	2.0	2.1	15.4	15.7
49.4	50.1	23.4	24.5	11.0	11.5	134.1	138.7
1.9	2.0	1.4	1.4	0.4	0.5	5.9	6.2
2.1	2.0	0.8	0.8	0.6	0.5	5.8	5.6
0.7	0.8	0.4	0.4	0.3	0.3	2.1	2.2
16.3	16.8	7.7	8.1	5.5	5.6	45.5	47.1
18.8	17.9	0.7	0.7	0.5	0.5	26.0	24.7
15.4	14.7	0.7	0.6	0.4	0.4	21.7	20.7
3.3	3.2	0.1	0.1	0.1	0.1	4.3	4.1
24.9	24.3	8.4	8.1	5.1	5.0	60.7	59.3
49.8	48.0	21.1	19.6	11.2	10.7	124.1	118.4
11.5	11.1	7.7	7.2	3.2	3.1	33.6	32.3
3.9	4.0	1.7	1.7	1.1	1.1	10.0	10.2
19.4	18.5	5.9	5.4	2.4	2.3	41.6	39.1
15.3	14.6	3.7	3.4	1.6	1.5	31.5	29.6
4.1	3.9	2.2	2.0	0.9	0.8	10.1	9.5
6.7	6.4	3.3	3.0	1.8	1.7	16.2	15.2

APPENDIX TABLE I.1 (Cont'd)

	SENSI- TIVITY CODE	ATLANTIC		QUEBEC	
		Alt. 1	Alt. 2	Alt. 1	Alt. 2
CLAY, GLASS AND STONE WORKERS	E	0.7	0.6	6.7	6.4
Lens Grinders, Etc.	D	0.1	0.1	0.7	0.7
Furnacemen, Etc., C. & G.	E	0.1	0.1	0.3	0.3
Stone Cutters & Dressers	D	0.1	0.1	0.8	0.7
STATIONARY ENGINE AND EXCAVATING AND LIFTING EQUIPMENT OPERATORS AND RELATED WORKERS	A	18.5	17.9	39.2	38.2
Boiler Firemen (exc. ship)	B	1.5	1.5	3.4	3.4
Stationary Enginemen	B	3.3	3.2	8.9	8.9
Motormen (veh.) Exc. Rail	E	0.4	0.4	0.4	0.4
Hoistmen, Etc., nes	A	10.2	9.8	19.0	18.3
Hoistmen, Etc.	B	2.6	2.5	5.5	5.3
Operators, nes	C	7.7	7.4	13.5	13.0
LONGSHOREMEN AND STEVEDORES	D	2.5	2.6	3.1	3.4
SECTIONMEN AND TRACKMEN	C	1.5	1.6	2.2	2.4
OTHER PRODUCTION PROCESS AND RELATED WORKERS	C	12.1	11.5	78.9	76.0
Tobacco Preparers, Etc.	E	0.0	0.0	4.2	4.0
Patternmakers (exc. paper)	E	0.1	0.1	0.6	0.5
Paper Products Makers	E	0.4	0.4	5.0	4.8
Photographic Proc. Occ.	D	0.2	0.2	1.4	1.5
Inspectors, Etc., nes, M.	D	0.5	0.5	5.0	4.8
Inspectors, Etc., nes	B	0.6	0.6	1.1	1.1

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
10.9	10.3	2.4	2.2	0.9	0.9	21.4	20.4
0.6	0.6	0.5	0.5	0.2	0.3	3.1	3.0
1.2	1.1	0.2	0.2	0.1	0.1	1.8	1.7
0.5	0.5	0.1	0.1	0.1	0.1	1.6	1.5
70.7	68.1	41.9	40.1	28.4	27.1	196.1	189.1
1.8	1.8	1.1	1.1	0.6	0.6	8.6	8.5
19.2	18.8	6.1	5.9	4.9	4.9	42.4	41.8
1.7	1.4	0.6	0.6	0.3	0.2	3.5	3.1
37.8	36.2	17.4	16.3	13.2	12.5	97.2	92.9
15.4	14.6	2.9	2.7	5.0	4.7	30.8	29.3
22.4	21.7	14.5	13.6	8.2	7.8	66.3	63.5
1.0	1.0	0.1	0.1	2.1	2.2	9.0	9.5
4.3	4.5	5.2	5.7	2.1	2.2	15.5	16.6
130.6	125.2	24.8	23.9	18.5	18.2	264.7	254.4
1.2	1.1	0.0	0.0	0.0	0.0	5.8	5.5
1.5	1.4	0.1	0.1	0.1	0.1	2.3	2.2
10.0	9.5	1.2	1.1	0.8	0.8	17.2	16.3
3.2	3.2	1.0	1.0	0.6	0.6	6.4	6.5
15.5	14.8	1.2	1.1	0.7	0.7	22.3	21.3
2.1	2.1	1.8	1.7	0.7	0.7	6.2	6.1

APPENDIX TABLE I.1 (Cont'd)

	SENSI- TIVITY CODE	ATLANTIC		QUEBEC	
		Alt. 1	Alt. 2	Alt. 1	Alt. 2
<u>LABOURERS (INCL. WAREHOUSEMEN AND FREIGHT HANDLERS, NES)</u>	A	32.1	31.8	91.2	90.9
Labourers	A	28.2	27.7	83.6	83.1
Warehousemen, nes	B	3.9	4.1	7.5	7.9
<u>ALL OCCUPATIONS</u>	B	622.2	625.3	2,484.4	2,509.1

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
118.0	116.3	51.8	50.3	31.4	30.9	322.5	318.5
109.4	107.6	46.6	44.9	26.8	26.2	292.4	287.6
8.6	8.7	5.2	5.4	4.6	4.7	30.1	30.9
3,483.7	3,454.9	1,485.8	1,464.2	850.0	861.0	8,926.0	8,914.4

DISTRIBUTIONS OF PROJECTED MANPOWER REQUIREMENTS

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
<u>MANAGERIAL OCCUPATIONS</u>	7.940	8.172	8.289	8.362
<u>PROFESSIONAL AND TECHNICAL OCCUPATIONS</u>	14.304	15.225	16.261	16.596
PROFESSIONAL ENGINEERS	.788	.784	1.143	1.132
Civil (incl. surveyors)	.450	.448	.443	.446
Mechanical	.145	.128	.286	.279
Mechanical	.112	.112	.197	.191
Industrial	.032	.032	.088	.088
Electrical	.112	.112	.193	.191
Chemical	.016	.016	.056	.052
BIOLOGISTS AND AGRICULTURAL PROFESSIONALS	.145	.128	.141	.139
Veterinarians	.016	.016	.016	.016
TEACHERS	5.706	6.205	5.567	5.579
Professors	.273	.304	.592	.610
School Teachers	5.143	5.597	4.564	4.727
HEALTH PROFESSIONALS	3.648	3.950	3.196	3.296
Physicians & Surgeons	.402	.432	.543	.562
Dentists	.080	.080	.092	.096
Nurses, Graduate	1.736	1.871	1.220	1.255
Nurses-in-Training	.723	.800	.584	.606
Osteopaths	.016	.016	.024	.024
Medical & D. Technicians	.530	.576	.547	.558

TABLE I.2

BY OCCUPATION CLASS BY REGION, 1975

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
8.792	8.845	8.229	8.449	9.388	9.547	8.556	8.667
14.826	15.097	15.022	15.510	15.576	15.796	15.312	15.677
1.381	1.363	.976	.970	1.212	1.185	1.182	1.170
.436	.443	.538	.546	.671	.662	.475	.481
.408	.396	.121	.123	.188	.197	.234	.277
.258	.252	.087	.082	.141	.139	.192	.186
.149	.145	.040	.034	.047	.046	.095	.092
.227	.223	.074	.075	.106	.104	.171	.168
.083	.081	.040	.034	.047	.046	.060	.057
.126	.127	.249	.253	.141	.139	.155	.152
.023	.020	.034	.027	.024	.023	.021	.020
3.775	3.910	4.994	5.245	4.318	4.437	4.652	4.844
.235	.246	.236	.253	.259	.267	.337	.351
3.378	3.499	4.523	4.747	3.870	3.984	4.060	4.228
3.445	3.560	3.904	4.091	4.247	4.367	3.542	3.677
.476	.495	.464	.492	.565	.581	.495	.515
.112	.116	.101	.102	.141	.139	.105	.109
1.607	1.664	1.736	1.817	2.071	2.123	1.580	1.642
.471	.486	.626	.656	.529	.546	.556	.579
.034	.035	.034	.034	.035	.046	.030	.031
.531	.541	.734	.765	.064	.639	.580	.596

APPENDIX TABLE I.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
LAW PROFESSIONALS	.161	.176	.262	.271
Judges & Magistrates	.016	.016	.008	.008
Lawyers & Notaries	.145	.160	.254	.259
RELIGION PROFESSIONALS	.804	.864	1.010	1.048
Clergymen, n.o.r.	.530	.576	.406	.422
Nuns & Brothers, n.o.r.	.209	.224	.475	.490
ARTISTS, WRITERS AND MUSICIANS	.402	.416	.720	.733
Artists & Art Teachers	.048	.048	.185	.187
Commercial	.016	.016	.092	.092
Except Commercial	.032	.032	.092	.096
Authors	.193	.192	.314	.319
Musicians	.161	.176	.221	.227
OTHER PROFESSIONALS	2.668	2.703	4.222	4.215
Architects	.048	.048	.129	.136
Draughtsmen	.209	.192	.318	.315
Actuaries	.032	.032	.113	.112
Librarians	.064	.080	.068	.072
Interior Decorators	.064	.064	.092	.096
Photographers	.032	.048	.080	.080
<u>CLERICAL OCCUPATIONS</u>	11.732	12.138	14.865	15.089
Office Appliance Oper.	.450	.464	1.006	1.016
Shipping & R. Clerks	.514	.528	.821	.805
Baggagemen, Transport	.016	.032	.020	.024

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
.255	.263	.242	.253	.294	.302	.255	.259
.009	.009	.013	.014	.012	.012	.010	.010
.247	.258	.229	.239	.282	.290	.240	.249
.468	.483	.579	.608	.388	.395	.652	.680
.319	.330	.431	.451	.306	.314	.379	.395
.103	.107	.081	.089	.024	.023	.202	.210
.772	.784	.518	.540	.671	.685	.676	.690
.212	.214	.101	.102	.153	.163	.166	.168
.144	.145	.067	.061	.071	.081	.100	.100
.069	.069	.034	.034	.082	.081	.067	.070
.347	.350	.229	.232	.294	.302	.301	.304
.212	.220	.195	.205	.224	.282	.208	.218
4.604	4.602	3.554	3.558	4.306	4.286	4.203	4.204
.112	.116	.101	.102	.141	.151	.112	.116
.468	.463	.330	.328	.376	.372	.375	.371
.141	.139	.047	.048	.047	.046	.100	.101
.112	.113	.074	.082	.106	.104	.088	.092
.118	.122	.081	.082	.106	.116	.084	.087
.078	.078	.061	.061	.082	.081	.072	.074
16.528	16.736	13.595	14.144	14.518	14.936	15.019	15.324
1.659	1.667	1.218	1.263	1.165	1.208	1.269	1.287
1.108	1.088	.660	.662	.635	.639	.859	.848
.017	.017	.034	.034	.012	.012	.021	.022

APPENDIX TABLE I.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
Ticket Agents, Transport	.128	.144	.076	.084
Stenographers	3.375	3.486	4.226	4.288
Stenographers	2.813	2.926	3.429	3.479
Typists	.546	.576	.797	.805
Attendants, D. & D. Off.	.048	.048	.036	.040
<u>SALES OCCUPATIONS</u>	6.284	6.637	6.384	6.520
Foremen, Trade	.112	.112	.165	.171
Auctioneers	.0	.0	.0	.0
Canvassers	.209	.208	.189	.191
Sales Clerks	4.757	5.086	3.768	3.894
Sales Clerks	4.034	4.302	3.309	3.416
Service Station Att.	.723	.784	.459	.478
Advertising Salesmen	.064	.064	.080	.080
Insurance Salesmen	.305	.320	.439	.458
Real Estate Salesmen	.048	.048	.141	.147
Security Salesmen	.032	.032	.060	.064
Brokers, nes	.096	.096	.109	.112
<u>SERVICE AND RECREATION OCCUPATIONS</u>	13.500	14.393	14.036	14.416
PROTECTIVE SERVICE OCCUPATIONS	1.543	1.535	1.952	1.945
Firemen, Fire Protection	.338	.336	.294	.291
Policemen & Detectives	.530	.512	.837	.837
Guards, Watchmen, nes	.675	.688	.821	.821

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
.086	.093	.148	.164	.141	.151	.102	.111
5.049	5.114	4.072	4.207	4.529	4.646	4.495	4.579
.376	3.815	3.204	3.306	3.718	3.810	3.511	3.577
1.286	1.300	.868	.902	.812	.836	.984	1.002
.098	.101	.094	.096	.176	.174	.084	.086
6.803	6.903	6.212	6.529	6.788	7.096	6.561	6.744
.244	.249	.175	.184	.129	.139	.187	.194
.003	.003	.007	.007	.0	.0	.003	.003
.218	.214	.222	.225	.235	.244	.213	.213
3.832	3.931	3.843	4.091	4.153	4.367	3.932	4.089
3.143	3.222	3.163	3.360	3.412	3.577	3.294	3.420
.689	.709	.680	.731	.741	.790	.638	.668
.121	.122	.081	.082	.094	.093	.095	.095
.399	.414	.303	.321	.341	.372	.380	.399
.261	.272	.209	.225	.423	.476	.224	.236
.072	.075	.047	.055	.082	.093	.065	.068
.141	.145	.168	.171	.165	.163	.133	.137
13.227	13.618	13.757	14.363	14.776	15.122	13.691	14.150
1.306	1.314	1.258	1.263	1.447	1.440	1.483	1.485
.230	.229	.289	.287	.318	.314	.270	.269
.468	.472	.538	.546	.506	.511	.570	.572
.608	.611	.431	.437	.624	.627	.642	.644

APPENDIX TABLE I.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
HOUSEKEEPERS, WAITERS, COOKS AND RELATED WORKERS	8.004	8.652	7.418	7.672
Housekeepers	.370	.400	.334	.351
Cooks	.948	1.008	1.208	1.247
Waiters	1.398	1.503	1.779	1.841
Waiters & Waitresses	1.302	1.407	1.574	1.630
Bartenders	.080	.096	.205	.211
Nursing Assistants & Aides	2.395	2.607	1.976	2.044
Porters, Baggage & Pullman	.080	.080	.064	.068
Baby Sitters, nes	2.073	2.239	1.348	1.391
Baby Sitters	.064	.064	.052	.056
Maids, nes	2.009	2.175	1.296	1.335
ATHLETES, ENTERTAINERS AND RELATED WORKERS	.161	.176	.217	.223
Actors	.048	.048	.109	.112
Athletes & Sports Offils.	.112	.128	.109	.112
OTHER SERVICE OCCUPATIONS	3.777	4.030	4.448	4.575
Barbers, Hairdres., Manic.	.450	.496	.551	.570
Launderers & Dry Cleaners	.771	.832	.813	.841
Elevator Tenders, Bldg.	.064	.064	.121	.124
Janitors & Cleaners, Bldg.	2.250	2.383	2.632	2.698
Funeral Dir. & Embalmers	.064	.064	.044	.044
Guides	.048	.048	.060	.060
<u>TRANSPORT AND COMMUNICATION OCCUPATIONS</u>	7.393	7.500	6.509	6.684
AIR PILOTS, NAVIGATORS AND FLIGHT ENGINEERS	.032	.048	.088	.096

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
6.915	7.158	7,565	7.929	8.353	8.571	7.416	7.709
.336	.347	.384	.403	.459	.476	.358	.375
.855	.886	1.151	1.195	1.400	1.417	1.058	1.095
1.613	1.667	1.804	1.892	2.035	2.102	1.702	1.770
1.458	1.598	1.534	1.612	1.741	1.789	1.508	1.568
.155	.159	.269	.280	.294	.302	.195	.202
2.282	2.365	2.571	2.698	2.800	2.880	2.313	2.407
.063	.066	.081	.082	.059	.058	.067	.072
1.082	1.120	1.184	1.236	1.259	1.278	1.250	1.296
.109	.113	.162	.164	.141	.151	.101	.105
.976	1.007	1.030	1.072	1.118	1.138	1.149	1.191
.227	.237	.148	.157	.271	.279	.210	.219
.086	.090	.047	.048	.118	.116	.085	.090
.144	.148	.101	.102	.165	.163	.125	.130
4.776	4.912	4.792	5.013	4.682	4.820	4.581	4.736
.537	.556	.464	.485	.459	.476	.518	.538
.801	.831	.821	.860	.871	.894	.813	.846
.083	.084	.067	.068	.082	.093	.089	.091
3.017	3.088	3.190	3.333	3.024	3.113	2.885	2.973
.054	.058	.047	.048	.047	.046	.050	.053
.075	.075	.027	.027	.024	.023	.055	.057
5.586	5.699	5.411	5.662	6.165	6.248	5.975	6.127
.057	.061	.087	.096	.235	.244	.085	.092

APPENDIX TABLE I.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
OPERATORS, RAILROAD	.289	.304	.117	.124
Locomotive Engineers	.080	.080	.028	.028
Locomotive Firemen	.016	.016	.008	.012
Conductors, Railroad	.048	.048	.024	.028
Brakemen, Switch. & Sig.	.145	.144	.052	.060
OPERATORS, WATER TRANSPORT	.659	.656	.169	.175
Deck & Engrg. Off., Ship	.257	.256	.068	.076
Deck Ratings (ship)	.305	.304	.076	.080
Engine-room Ratings, Ship	.096	.112	.020	.024
OPERATORS, ROAD TRANSPORT	5.047	5.102	4.894	4.982
Bus Drivers	.707	.768	.394	.430
Taxi Drivers & Chauffeurs	.354	.368	.447	.482
OTHER TRANSPORT OCCUPATIONS	.241	.240	.154	.167
Operators, E. S. Railway	.0	.0	.0	.0
OTHER COMMUNICATION OCCUPATIONS	1.109	1.167	1.083	1.136
Radio & TV Announcers	.064	.064	.032	.036
Telephone Operators	.595	.624	.672	.693
Telegraph Operators	.064	.064	.036	.036
Postmen & Mail Carriers	.209	.224	.145	.159
<u>FARMERS AND FARM WORKERS</u>	3.439	2.623	3.405	3.097
Farmers & Stockraisers	1.639	1.167	1.626	1.459

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
.175	.185	.229	.253	.176	.186	.114	.185
.052	.052	.061	.068	.047	.046	.047	.049
.017	.017	.020	.020	.024	.023	.017	.018
.037	.040	.047	.048	.035	.035	.036	.038
.072	.075	.010	.109	.071	.070	.074	.080
.109	.113	.027	.027	.494	.499	.192	.197
.040	.040	.007	.007	.271	.267	.080	.083
.052	.052	.020	.020	.188	.186	.085	.087
.017	.020	.0	.0	.035	.046	.026	.027
4.085	4.130	3.917	4.043	4.071	4.088	4.351	4.418
.273	.289	.592	.642	.541	.557	.422	.451
.215	.226	.141	.157	.200	.209	.274	.293
.184	.919	.175	.191	.212	.209	.183	.192
.023	.023	.0	.0	.0	.0	.009	.010
.976	1.019	.976	1.052	.976	1.022	.991	1.043
.034	.035	.054	.055	.035	.046	.038	.042
.660	.680	.633	.676	.576	.592	.635	.662
.032	.032	.040	.048	.047	.046	.037	.040
.161	.174	.135	.150	.188	.197	.158	.172
3.628	3.320	13.420	11.679	3.024	2.741	5.128	4.530
1.668	1.494	8.203	6.918	1.153	1.010	2.656	2.305

APPENDIX TABLE I.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
Farm Managers & Foremen	.048	.032	.016	.016
Farm Labourers	1.270	.944	1.336	1.208
Gardeners (exc. farm)	.482	.464	.422	.414
Gardeners (exc. farm)	.402	.400	.358	.355
Other Agricultural Occ.	.080	.064	.064	.060
<u>LOGGERS AND RELATED WORKERS</u>	1.414	1.279	.568	.502
Forest Rangers & Cruisers	.145	.144	.105	.096
<u>FISHERMEN, TRAPPERS AND HUNTERS</u>	2.925	1.967	.032	.028
Fishermen	2.925	1.967	.028	.020
Trappers & Hunters	.0	.0	.004	.004
<u>MINERS, QUARRYMEN AND RELATED WORKERS</u>	1.655	1.519	.455	.414
Prospectors	.0	.0	.008	.008
<u>CRAFTSMEN, PRODUCTION PROCESS AND RELATED WORKERS</u>	24.269	23.445	25.531	24.662
MILLERS, BAKERS, BREWERS AND RELATED FOOD WORKERS	2.957	2.751	1.417	1.379
Millers of Flour & Grain	.016	.016	.040	.040
Fruit & Veg. Canners	.048	.048	.040	.036

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
.040	.038	.074	.068	.071	.070	.041	.037
1.358	1.227	4.516	3.913	1.047	.918	1.850	1.616
.565	.562	.808	.778	.765	.755	.581	.570
.456	.460	.518	.526	.659	.650	.456	.458
.112	.101	.289	.260	.106	.093	.125	.112
.215	.197	.458	.287	1.400	1.231	.569	.492
.060	.055	.303	.191	.271	.232	.131	.113
.023	.020	.135	.102	.376	.325	.276	.201
.020	.017	.074	.055	.365	.325	.260	.189
.003	.003	.061	.048	.0	.0	.016	.011
.606	.515	.848	.765	.718	.616	.665	.589
.006	.006	.007	.007	.024	.023	.008	.009
26.380	25.688	19.431	19.075	23.588	22.753	24.635	23.932
1.326	1.288	1.090	1.052	1.224	1.185	1.448	1.403
.040	.038	.034	.034	.012	.012	.035	.032
.169	.162	.027	.027	.165	.151	.098	.093

APPENDIX TABLE I.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
TIRE BUILDERS, VULCANIZERS AND OTHER RUBBER WORKERS	.032	.032	.145	.139
Tire & Tube Builders	.0	.0	.008	.008
Vulcanizers	.032	.032	.032	.032
LEATHER CUTTERS, LASTERS, SEWERS AND OTHER LEATHER WORKERS (EXCEPT GLOVE AND GARMENT)	.096	.096	.648	.614
Leather Cutters	.016	.0	.072	.068
Shoemakers, Factory, nes	.048	.048	.471	.442
Shoemakers, Not in Factory	.032	.048	.064	.068
SPINNERS, WEAVERS, KNITTERS AND RELATED WORKERS	.096	.096	.523	.490
Weavers	.016	.016	.076	.076
TAILORS, FURRIERS, UPHOLST- ERERS AND RELATED WORKERS	.530	.528	2.906	2.778
Dressmakers Not in Factory	.241	.256	.423	.438
Upholsterers	.032	.032	.084	.080
CARPENTERS, CABINETMAKERS, SAWYERS AND RELATED WORKERS	3.504	3.310	2.286	2.180
Carpenters	2.764	2.623	1.530	1.463
Sawyers	.370	.352	.165	.155
Inspectors, Log & Lumber	.080	.080	.101	.096

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
.241	.234	.074	.075	.071	.081	.153	.150
.066	.064	.013	.014	.012	.012	.029	.029
.046	.046	.047	.055	.059	.058	.043	.043
.388	.373	.081	.082	.071	.070	.366	.351
.037	.038	.007	.007	.0	.0	.037	.036
.281	.269	.013	.014	.012	.012	.255	.241
.040	.040	.054	.055	.059	.058	.049	.052
.247	.234	.013	.014	.024	.023	.262	.248
.026	.026	.0	.0	.0	.0	.036	.034
1.309	1.271	1.003	.970	.612	.604	1.617	1.560
.238	.246	.229	.246	.271	.290	.286	.296
.115	.110	.074	.068	.071	.070	.088	.085
1.751	1.696	1.864	1.762	4.012	3.786	2.278	2.177
1.134	1.103	1.521	1.441	1.600	1.510	1.470	1.408
.115	.110	.074	.068	.929	.871	.255	.214
.040	.038	.020	.014	.494	.464	.102	.096

APPENDIX TABLE I.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
PRINTERS, BOOKBINDERS AND RELATED WORKERS	.370	.336	.785	.745
Compositors & Typesetters	.177	.160	.246	.235
Photoengravers, Pressmen	.128	.112	.366	.345
Pressmen, Printing	.096	.096	.262	.247
Lithographic Occ.	.016	.016	.076	.072
Photoengravers	.016	.016	.032	.028
Bookbinders	.032	.032	.101	.095
Other Occ. in Bookbind.	.016	.016	.020	.020
Printing Workers, nes	.016	.016	.052	.048
FURNACEMEN, MOULDERS, BLACKSMITHS AND RELATED METAL WORKERS	.305	.288	.414	.394
Heat Treaters, Etc.	.0	.0	.012	.012
Rolling Mill Operators	.048	.032	.020	.020
Blacksmiths, Etc.	.064	.064	.056	.056
Coremakers	.0	.0	.004	.004
JEWELLERS, WATCHMAKERS AND ENGRAVERS	.048	.048	.117	.116
Engravers, Exc. Photoeng.	.0	.0	.016	.016
MACHINISTS, PLUMBERS, SHEET METAL WORKERS AND RELATED WORKERS	2.909	2.735	3.490	3.320
Toolmakers, Diemakers	.016	.016	.092	.088
Filers, Grinders, Etc.	.032	.032	.048	.049
Millwrights	.193	.176	.125	.116
Fitters & A., nes, Metal	.096	.096	.153	.143

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
1.051	1.007	.498	.464	.494	.464	.772	.735
.310	.298	.202	.191	.188	.174	.251	.239
.508	.486	.195	.178	.212	.197	.356	.338
.321	.307	.148	.136	.141	.128	.241	.229
.135	.127	.034	.034	.059	.058	.083	.080
.052	.049	.013	.014	.012	.012	.032	.030
.096	.090	.047	.047	.047	.046	.077	.074
.054	.052	.027	.027	.024	.023	.034	.032
.086	.081	.020	.020	.024	.023	.054	.052
.620	.059	.209	.198	.362	.035	.445	.422
.040	.038	.0	.0	.012	.012	.019	.018
.089	.087	.020	.020	.012	.012	.046	.044
.043	.043	.047	.047	.035	.035	.049	.048
.020	.020	.007	.007	.0	.0	.010	.009
.086	.087	.054	.055	.071	.070	.084	.085
.017	.014	.007	.007	.012	.012	.013	.012
5.270	5.068	2.537	2.438	3.188	3.008	3.928	3.752
.356	.339	.020	.014	.024	.023	.164	.156
.155	.148	.027	.027	.106	.104	.087	.084
.244	.232	.074	.068	.376	.348	.192	.181
.557	.532	.047	.047	.059	.058	.270	.256

APPENDIX TABLE I.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
Plumbers & Pipefitters	.755	.704	.660	.626
Sheet Metal Workers	.193	.176	.237	.223
Riveters & Rivet Heaters	.016	.016	.024	.020
Boilermakers, Etc.	.305	.288	.169	.155
Welders & Flame Cutters	.788	.752	.962	.925
Polishers & Buffers, Metal	.0	.0	.028	.024
MECHANICS AND REPAIRMEN, ELECTRICIANS AND RELATED ELECTRICAL AND ELECTRONICS WORKERS	5.577	5.645	5.534	5.536
Mechanics & R., Aircraft	.128	.128	.266	.267
Mechanics & R., Motor Veh.	1.559	1.647	1.642	1.698
Mechanics & R., Railroad	.096	.096	.068	.072
Power Station Operators	.112	.112	.064	.060
Projectionists, Mot. Pic.	.016	.032	.024	.024
Linemen	.739	.752	.467	.478
Fitters, nes	.048	.048	.258	.243
Fitters	.032	.032	.221	.207
Electrical Workers, nes	.0	.0	.036	.036
PAINTERS, PAPERHANGERS AND GLAZIERS	.836	.816	.688	.674
BRICKLAYERS, PLASTERERS AND CONSTRUCTION WORKERS, NES	1.350	1.295	1.328	1.259
General Foremen, Constn.	.562	.544	.326	.311
Inspectors, Construction	.096	.096	.121	.120
Bricklayers, Etc.	.418	.400	.435	.406
Bricklayers, Etc.	.354	.320	.338	.315
Cement and Concrete Fin.	.080	.064	.097	.092
Plasterers & Lathers	.080	.080	.157	.147

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
.545	.527	.586	.546	.565	.534	.611	.581
.287	.278	.296	.273	.247	.232	.263	.249
.009	.009	.007	.007	.0	.0	.012	.011
.155	.148	.114	.109	.294	.267	.177	.168
1.162	1.123	.983	.963	.929	.883	1.024	.986
.057	.055	.007	.007	.012	.012	.030	.029
5.704	5.685	5.021	5.156	5.424	5.424	5.537	5.555
.072	.072	.222	.232	.235	.244	.172	.176
1.418	1.450	1.575	1.673	1.294	1.336	1.502	1.556
.054	.058	.094	.096	.047	.058	.066	.070
.060	.058	.054	.055	.071	.058	.065	.065
.020	.023	.027	.027	.035	.035	.024	.025
.468	.486	.518	.553	.647	.650	.510	.528
.540	.518	.047	.047	.059	.058	.291	.277
.442	.425	.047	.041	.047	.046	.243	.232
.095	.093	.007	.007	.012	.012	.048	.046
.715	.703	.565	.553	.600	.581	.680	.665
1.430	1.389	1.420	1.339	1.318	1.243	1.390	1.328
.330	.321	.518	.492	.376	.360	.376	.362
.112	.116	.114	.116	.129	.128	.112	.114
.557	.535	.397	.369	.282	.267	.466	.439
.439	.422	.249	.232	.188	.174	.353	.332
.118	.113	.148	.136	.106	.093	.113	.106
.192	.185	.224	.205	.212	.197	.181	.170

APPENDIX TABLE I.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
CLAY, GLASS AND STONE WORKERS	.112	.096	.270	.255
Lens Grinders, Etc.	.016	.016	.028	.028
Furnacemen, Etc., C. & G.	.016	.016	.012	.012
Stone Cutters & Dressers	.016	.016	.032	.028
STATIONARY ENGINE AND EXCAVATING AND LIFTING EQUIPMENT OPERATORS AND RELATED WORKERS	2.973	2.863	1.578	1.522
Boiler Firemen (exc. ship)	.241	.240	.137	.136
Stationary Enginemen	.530	.512	.358	.355
Motormen (veh.) Exc. Rail	.064	.064	.016	.016
Hoistmen, Etc., nes	1.639	1.567	.765	.729
Hoistmen, Etc.	.418	.400	.221	.211
Operators, nes	1.238	1.183	.543	.518
LONGSHOREMEN AND STEVEDORES	.402	.716	.125	.136
SECTIONMEN AND TRACKMEN	.241	.256	.088	.096
OTHER PRODUCTION PROCESS AND RELATED WORKERS	1.945	1.839	3.176	3.029
Tobacco Preparers, Etc.	.0	.0	.169	.159
Patternmakers (exc. paper)	.016	.016	.024	.020
Paper Products Makers	.064	.064	.201	.191
Photographic Proc. Occ.	.032	.032	.056	.060
Inspectors, Etc., nes, M.	.080	.080	.201	.191
Inspectors, Etc., nes	.096	.096	.044	.044

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
.313	.298	.162	.150	.106	.104	.240	.229
.017	.017	.034	.034	.024	.035	.035	.034
.034	.032	.013	.014	.012	.012	.020	.019
.014	.014	.007	.007	.012	.012	.018	.017
2.029	1.971	2.820	2.739	3.341	3.148	2.197	2.121
.052	.052	.074	.075	.071	.070	.096	.095
.551	.544	.411	.403	.576	.569	.475	.469
.049	.040	.040	.041	.035	.023	.039	.035
1.085	1.048	1.171	1.113	1.553	1.452	1.089	1.042
.442	.422	.195	.184	.588	.546	.345	.329
.643	.628	.976	.929	.965	.906	.743	.712
.029	.029	.007	.007	.247	.256	.101	.106
.123	.130	.350	.389	.247	.256	.174	.186
3.749	3.624	1.669	1.632	2.176	2.114	2.965	2.854
.034	.032	.0	.0	.0	.0	.065	.062
.043	.040	.007	.007	.012	.012	.026	.025
.287	.275	.081	.075	.094	.093	.193	.183
.092	.093	.067	.068	.071	.070	.072	.073
.445	.428	.081	.075	.082	.081	.250	.239
.060	.061	.121	.116	.082	.081	.609	.068

APPENDIX TABLE I.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
<u>LABOURERS (INCL. WAREHOUSEMEN AND FREIGHT HANDLERS, N.E.S.)</u>	5.159	5.086	3.671	3.623
Labourers	4.532	4.430	3.365	3.312
Warehousemen, n.e.s.	.627	.656	.302	.315
<u>ALL OCCUPATIONS</u>	100.000	100.000	100.000	100.000

REQUIRED MANPOWER INFLOW BY

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
<u>MANAGERIAL OCCUPATIONS</u>	16.6	18.3	97.3	101.3
<u>PROFESSIONAL AND TECHNICAL OCCUPATIONS</u>	48.2	54.4	255.0	267.4
PROFESSIONAL ENGINEERS	2.7	2.7	17.7	17.7
Civil (incl. surveyors)	1.5	1.5	7.2	7.4
Mechanical	0.5	0.4	4.4	4.3
Mechanical	0.4	0.4	3.0	2.9
Industrial	0.1	0.1	1.4	1.4
Electrical	0.3	0.3	2.6	2.6
Chemical	0.1	0.1	0.8	0.7
BIOLOGISTS AND AGRICULTURAL PROFESSIONALS	0.5	0.4	2.4	2.4
Veterinarians	0.0	0.0	0.2	0.2
TEACHERS	18.9	22.2	86.9	93.1
Professors	1.1	1.3	10.5	11.1
School Teachers	16.7	19.7	70.1	75.3
HEALTH PROFESSIONALS	12.5	14.5	51.3	54.6
Physicians & Surgeons	1.4	1.6	8.7	9.3
Dentists	0.2	0.2	1.3	1.4
Nurses, Graduate	5.8	6.7	19.1	20.3
Nurses-in-Training	2.2	2.7	8.7	9.4
Osteopaths	0.1	0.1	0.4	0.4
Medical & D. Technicians	2.4	2.7	10.6	11.0

TABLE II.1

OCCUPATION CLASS BY REGION, 1961-75

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
149.3	148.6	54.1	55.6	36.6	39.0	354.0	362.9
329.5	334.6	139.6	143.5	87.3	90.9	861.3	892.0
31.2	30.2	9.2	8.9	7.0	6.9	67.1	65.9
9.7	9.8	5.2	5.2	3.9	3.9	27.2	27.7
9.5	9.0	1.1	1.1	1.1	1.2	16.3	15.6
6.0	5.7	0.8	0.7	0.8	0.8	11.0	10.5
3.5	3.3	0.4	0.3	0.3	0.3	5.5	5.2
4.8	4.6	0.6	0.6	0.5	0.5	8.7	8.4
1.7	1.6	0.4	0.3	0.2	0.2	3.2	2.9
2.9	2.9	2.5	2.5	0.8	0.8	9.3	9.1
0.3	0.2	0.2	0.1	0.1	0.1	0.8	0.7
82.8	86.4	45.4	48.0	24.1	25.6	257.1	273.7
5.9	6.2	2.5	2.7	1.6	1.7	21.4	22.6
73.2	76.4	40.5	42.8	21.3	22.7	221.1	235.6
76.6	79.6	36.3	38.2	23.8	25.3	200.4	212.0
10.6	11.1	4.3	4.6	3.2	3.4	28.1	29.8
2.2	2.3	0.8	0.8	0.7	0.7	5.3	5.6
34.8	36.3	15.7	16.5	11.4	12.1	87.3	92.7
9.9	10.3	5.4	5.7	3.8	4.0	29.4	31.4
0.8	0.8	0.3	0.3	0.2	0.3	1.9	2.0
14.5	14.7	8.4	8.7	4.3	4.4	40.4	41.7

APPENDIX TABLE II.1 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
LAW PROFESSIONALS	0.5	0.6	3.8	4.1
Judges & Magistrates	0.0	0.0	0.1	0.1
Lawyers & Notaries	0.4	0.5	3.7	3.9
RELIGION PROFESSIONALS	2.2	2.6	13.8	15.0
Clergymen, n.o.r.	1.6	1.9	5.9	6.4
Nuns & Brothers, n.o.r.	0.5	0.6	6.4	6.9
ARTISTS, WRITERS AND MUSICIANS	1.2	1.3	10.4	10.9
Artists & Art Teachers	0.1	0.1	2.8	2.9
Commercial	0.0	0.0	1.2	1.2
Except Commercial	0.1	0.1	1.6	1.7
Authors	0.7	0.7	4.8	5.0
Musicians	0.4	0.5	2.9	3.1
OTHER PROFESSIONALS	9.8	10.1	68.7	69.8
Architects	0.2	0.2	2.5	2.7
Draughtsmen	0.6	0.5	4.0	4.0
Actuaries	0.1	0.1	2.1	2.1
Librarians	0.2	0.3	1.1	1.2
Interior Decorators	0.2	0.2	1.5	1.6
Photographers	0.1	0.2	1.1	1.1
<u>CLERICAL OCCUPATIONS</u>	28.4	31.3	183.4	192.7
Office Appliance Oper.	2.0	2.1	19.9	20.4
Shipping & R. Clerks	0.9	1.0	8.4	8.2
Baggagemen, Transport	0.0	0.1	0.1	0.2

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
5.1	5.3	2.0	2.1	1.5	1.6	12.6	13.4
0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.3
5.0	5.3	1.9	2.0	1.5	1.6	12.3	13.1
9.1	9.5	4.7	5.0	2.0	2.1	31.7	34.1
6.5	6.8	3.7	3.9	1.6	1.7	19.7	21.1
1.9	2.0	0.6	0.7	0.1	0.1	9.5	10.2
16.1	16.3	4.3	4.5	3.4	3.6	35.0	36.2
4.7	4.7	0.9	0.9	0.8	0.9	9.0	9.2
2.9	2.9	0.6	0.5	0.3	0.4	4.9	4.9
1.7	1.7	0.3	0.3	0.5	0.5	4.2	4.4
7.7	7.7	2.1	2.1	1.6	1.7	16.8	17.0
3.8	4.0	1.4	1.5	1.0	1.1	9.3	10.1
105.6	104.2	35.1	34.4	24.8	25.1	248.0	247.6
3.1	3.2	1.2	1.2	1.0	1.1	7.8	8.1
8.9	8.6	2.7	2.6	1.8	1.8	18.0	17.6
3.7	3.6	0.5	0.5	0.3	0.3	6.7	6.8
2.4	2.5	0.7	0.8	0.6	0.6	5.0	5.3
2.7	2.8	0.7	0.7	0.6	0.7	4.3	4.6
1.6	1.6	0.5	0.5	0.4	0.4	3.6	3.8
283.8	286.2	96.3	101.4	62.1	67.3	651.0	676.4
46.3	46.1	13.6	14.0	7.7	8.2	89.2	90.6
19.1	18.1	4.2	4.1	2.2	2.3	34.2	33.1
0.2	0.2	0.1	0.1	0.0	0.0	0.5	0.6

APPENDIX TABLE II.1 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
Ticket Agents, Transport	0.1	0.2	0.5	0.7
Stenographers	8.7	9.5	56.7	59.3
Stenographers	7.5	8.3	46.4	48.5
Typists	1.2	1.4	10.3	10.7
Attendants, D. & D. Off.	0.2	0.2	0.5	0.6
<u>SALES OCCUPATIONS</u>	11.4	13.8	73.5	78.5
Foremen, Trade	0.3	0.3	2.2	2.4
Auctioneers	0.0	0.0	0.0	0.0
Canvassers	0.3	0.3	1.7	1.8
Sales Clerks	8.3	10.5	42.7	46.8
Sales Clerks	5.2	7.0	34.1	37.6
Service Station Att.	3.1	3.5	8.7	9.3
Advertising Salesmen	0.3	0.3	1.4	1.4
Insurance Salesmen	0.7	0.8	4.4	5.0
Real Estate Salesmen	0.2	0.2	2.1	2.3
Security Salesmen	0.0	0.0	0.5	0.6
Brokers, nes	0.4	0.4	1.7	1.8
<u>SERVICE AND RECREATION OCCUPATIONS</u>	35.3	41.3	194.7	207.7
PROTECTIVE SERVICE OCCUPATIONS	4.2	4.2	29.7	30.0
Firemen, Fire Protection	0.9	0.9	4.8	4.8
Policemen & Detectives	1.4	1.3	13.6	13.8
Guards, Watchmen, nes	1.9	2.0	11.4	11.6

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
0.9	1.1	0.6	0.8	0.4	0.5	2.6	3.4
94.6	95.4	30.7	31.8	21.0	22.5	212.0	219.0
72.2	72.9	24.6	25.4	17.6	18.8	168.6	174.1
22.4	22.5	6.1	6.4	3.5	3.8	43.3	44.8
1.9	2.0	0.8	0.8	0.9	0.9	4.2	4.4
112.3	113.8	37.0	40.3	24.3	27.7	259.4	275.0
4.6	4.7	1.3	1.4	0.5	0.6	8.6	9.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.4	3.2	1.2	1.2	0.7	0.8	7.4	7.4
59.1	61.4	20.8	23.6	14.0	16.3	146.8	160.3
41.2	43.0	13.7	15.9	9.4	11.2	104.8	115.7
17.9	18.4	7.2	7.8	4.6	5.1	42.0	44.6
3.1	3.1	0.9	0.9	0.6	0.6	6.1	6.1
5.2	5.6	1.7	1.9	1.0	1.3	11.9	13.6
5.1	5.4	1.7	1.9	2.0	2.5	11.5	12.5
0.7	0.8	0.2	0.3	0.2	0.3	1.8	2.1
3.1	3.2	1.6	1.6	0.9	0.9	7.4	7.7
253.9	263.6	109.2	115.1	71.4	76.0	663.2	702.5
23.7	23.6	10.7	10.5	6.7	6.8	72.9	72.9
4.1	4.0	2.4	2.3	1.5	1.5	13.4	13.3
8.4	8.4	4.5	4.5	2.3	2.4	28.4	28.5
11.2	11.1	3.8	3.8	2.9	3.0	31.0	31.1

APPENDIX TABLE II.1 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
HOUSEKEEPERS, WAITERS, COOKS AND RELATED WORKERS	17.9	22.2	92.3	100.5
Housekeepers	1.1	1.3	4.8	5.3
Cooks	2.5	2.9	17.4	18.7
Waiters	4.0	4.7	23.2	25.2
Waiters & Waitresses	3.7	4.4	20.1	21.9
Bartenders	0.2	0.3	3.0	3.2
Nursing Assistants & Aides	10.2	11.6	36.7	38.9
Porters, Baggage & Pullman	0.1	0.1	0.5	0.6
Baby Sitters, nes	-3.0	-1.9	-4.9	-3.5
Baby Sitters	-0.1	-0.1	-0.3	-0.2
Maids, nes	-2.9	-1.8	-4.6	-3.3
ATHLETES, ENTERTAINERS AND RELATED WORKERS	0.7	0.8	3.9	4.1
Actors	0.2	0.2	1.9	2.0
Athletes & Sports Offils.	0.5	0.6	2.0	2.1
OTHER SERVICE OCCUPATIONS	12.5	14.2	68.7	73.0
Barbers, Hairdres., Manic.	0.3	0.6	3.6	4.2
Launderers & Dry Cleaners	2.6	3.0	13.1	14.0
Elevator Tenders, Bldg.	0.2	0.2	1.5	1.6
Janitors & Cleaners, Bldg.	8.8	9.7	45.6	47.9
Funeral Dir. & Embalmers	0.2	0.2	0.6	0.6
Guides	0.1	0.1	0.8	0.8
<u>TRANSPORT AND COMMUNICATION OCCUPATIONS</u>	15.9	16.8	72.0	78.0
AIR PILOTS, NAVIGATORS AND FLIGHT ENGINEERS	0.1	0.2	1.6	1.8

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
121.1	127.5	53.2	56.9	37.4	40.2	325.5	350.7
6.9	7.2	3.2	3.4	2.3	2.5	18.3	19.7
17.8	18.6	9.6	10.0	7.0	7.3	54.0	57.2
29.3	30.7	13.3	14.2	9.4	10.2	77.9	83.8
26.0	27.3	10.9	11.7	7.9	8.5	67.7	72.9
3.3	3.4	2.3	2.4	1.5	1.6	10.3	10.9
59.4	61.6	28.0	29.3	18.0	19.0	153.4	161.5
0.8	0.9	0.4	0.4	0.2	0.2	2.1	2.5
-4.9	-3.9	-3.5	-3.0	-0.4	-0.1	-17.4	-13.5
-0.7	-0.6	-0.6	-0.6	-0.2	-0.1	-0.2	-1.6
-4.1	-3.3	-2.8	-2.4	-0.3	0.0	-15.5	-11.9
5.8	6.1	1.6	1.7	1.7	1.8	13.6	14.4
2.2	2.3	0.5	0.5	0.7	0.7	5.4	5.8
3.7	3.8	1.1	1.1	1.1	1.1	8.3	8.7
103.2	106.5	43.8	46.0	25.4	27.1	251.0	264.3
5.0	5.5	1.6	1.8	1.0	1.2	11.6	13.4
17.8	18.6	7.5	7.9	4.9	5.2	46.0	48.8
1.4	1.4	0.4	0.4	0.3	0.4	3.8	4.0
72.9	74.5	32.6	34.0	18.2	19.3	177.9	185.4
1.0	1.1	0.4	0.4	0.2	0.2	2.5	2.7
1.5	1.5	0.2	0.2	0.1	0.1	2.7	2.9
92.1	94.4	32.9	35.4	24.1	25.5	235.2	248.1
1.5	1.6	0.9	1.0	1.6	1.7	5.6	6.2

APPENDIX TABLE II.1 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
OPERATORS, RAILROAD	-0.6	-0.5	-1.1	-0.9
Locomotive Engineers	-0.2	-0.2	-0.3	-0.3
Locomotive Firemen	-0.2	-0.2	-0.3	-0.2
Conductors, Railroad	-0.1	-0.1	-0.2	-0.1
Brakemen, Switch. & Sig.	-0.1	-0.1	-0.4	-0.2
OPERATORS, WATER TRANSPORT	0.6	0.6	0.8	1.0
Deck & Engrg. Off., Ship	0.1	0.1	0.1	0.3
Deck Ratings (ship)	0.3	0.3	0.4	0.5
Engine-room Ratings, Ship	0.2	0.3	0.1	0.2
OPERATORS, ROAD TRANSPORT	14.5	15.0	59.7	63.1
Bus Drivers	3.1	3.5	5.4	6.4
Taxi Drivers & Chauffeurs	0.5	0.6	3.3	4.3
OTHER TRANSPORT OCCUPATIONS	-0.4	-0.4	-0.5	-0.2
Operators, E. S. Railway	0.0	0.0	0.0	0.0
OTHER COMMUNICATION OCCUPATIONS	1.6	2.0	11.5	13.1
Radio & TV Announcers	0.3	0.3	0.5	0.6
Telephone Operators	1.1	1.3	8.4	9.1
Telegraph Operators	-0.1	-0.1	0.0	0.0
Postmen & Mail Carriers	0.2	0.3	0.9	1.3
<u>FARMERS AND FARM WORKERS</u>	-5.1	-10.1	-19.7	-26.6
Farmers & Stockraisers	-5.1	-8.0	-17.9	-21.7

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
-1.7	-1.4	-1.6	-1.3	-0.4	-0.3	-5.5	-4.5
-0.3	-0.3	-0.4	-0.3	-0.1	-0.1	-1.4	-1.2
-0.5	-0.5	-0.4	-0.4	-0.1	-0.1	-1.3	-1.2
-0.4	-0.3	-0.2	-0.2	-0.1	-0.1	-1.1	-0.9
-0.3	-0.2	-0.6	-0.5	-0.1	-0.1	-1.7	-1.2
1.0	1.1	0.1	0.1	1.2	1.3	4.0	4.5
0.2	0.2	0.0	0.0	0.5	0.5	1.0	1.3
0.6	0.6	0.1	0.1	0.5	0.5	2.0	2.2
0.2	0.3	0.0	0.0	0.2	0.3	1.0	1.1
77.2	77.6	28.8	29.8	18.2	18.8	198.8	204.2
5.9	6.4	5.6	6.2	3.1	3.3	23.7	26.2
2.9	3.2	0.6	0.8	0.6	0.7	7.8	9.4
-0.1	0.1	-0.1	0.0	0.2	0.2	-0.8	0.0
-0.1	-0.1	0.0	0.0	0.0	0.0	-0.2	-0.1
14.3	15.5	4.7	5.6	3.3	3.8	33.2	37.7
0.8	0.8	0.5	0.5	0.2	0.3	2.2	2.5
11.6	12.1	3.4	3.9	2.3	2.5	25.8	28.1
0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.3
1.7	2.1	0.5	0.7	0.6	0.7	4.0	5.2
-3.3	-15.0	-13.4	-41.8	7.2	5.1	-34.6	-88.5
-13.0	-19.5	-19.8	-37.7	1.0	-1.0	-55.8	-87.4

APPENDIX TABLE II.1 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
Farm Managers & Foremen	0.1	0.0	0.1	0.1
Farm Labourers	-1.5	-3.5	-7.8	-10.7
Gardeners (exc. farm)	1.4	1.3	5.7	5.6
Gardeners (exc. farm)	1.2	1.2	4.7	4.7
Other Agricultural Occ.	0.3	0.2	1.0	0.9
<u>LOGGERS AND RELATED WORKERS</u>	-5.2	-6.0	-10.6	-12.1
Forest Rangers & Cruisers	0.3	0.3	0.8	0.6
<u>FISHERMEN, TRAPPERS AND HUNTERS</u>	2.0	-3.9	-1.3	-1.4
Fishermen	2.1	-3.8	-1.1	-1.3
Trappers & Hunters	0.0	0.0	-0.2	-0.2
<u>MINERS, QUARRYMEN AND RELATED WORKERS</u>	2.4	1.6	1.3	0.4
Prospectors	0.0	0.0	0.0	0.0
<u>CRAFTSMEN, PRODUCTION PROCESS AND RELATED WORKERS</u>	64.2	59.8	254.1	238.6
MILLERS, BAKERS, BREWERS AND RELATED FOOD WORKERS	9.0	7.8	17.8	17.2
Millers of Flour & Grain	0.1	0.1	0.4	0.4
Fruit & Veg. Cannery	0.2	0.2	0.6	0.5

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
0.4	0.3	0.4	0.3	0.3	0.3	1.2	0.8
-1.5	-6.4	-1.6	-11.4	2.2	1.2	-9.5	-30.5
10.8	10.5	7.5	6.9	3.8	3.8	29.5	28.4
8.4	8.4	4.6	4.6	3.3	3.3	22.2	22.3
2.5	2.1	2.9	2.4	0.6	0.5	7.3	6.1
-1.1	-1.8	3.8	1.2	2.5	1.2	-8.7	-15.6
1.0	0.8	3.1	1.4	1.5	1.2	6.0	4.4
-0.6	-0.7	-0.3	-0.8	-0.5	-0.9	-1.1	-7.8
-0.4	-0.5	-0.1	-0.4	-0.6	-0.9	-0.7	-7.0
-0.2	-0.2	-0.3	-0.5	0.0	0.0	-0.4	-0.8
2.2	-1.1	5.1	3.7	2.5	1.7	11.6	4.7
0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0
458.6	427.1	147.0	137.6	99.2	94.6	1,028.8	963.3
26.8	25.1	8.3	7.5	5.3	5.1	70.1	65.9
0.7	0.6	0.2	0.2	0.1	0.1	1.4	1.2
4.1	3.8	0.3	0.3	0.9	0.8	5.9	5.4

APPENDIX TABLE II.1 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
TIRE BUILDERS, VULCANIZERS AND OTHER RUBBER WORKERS	0.1	0.1	1.0	0.9
Tire & Tube Builders	0.0	0.0	0.1	0.1
Vulcanizers	0.1	0.1	0.5	0.5
LEATHER CUTTERS, LASTERS, SEWERS AND OTHER LEATHER WORKERS (EXCEPT GLOVE AND GARMENT)	0.1	0.1	5.8	5.1
Leather Cutters	0.1	0.0	0.6	0.5
Shoemakers, Factory, nes	0.1	0.1	5.5	4.9
Shoemakers, Not in Factory	0.0	0.1	0.3	0.4
SPINNERS, WEAVERS, KNITTERS AND RELATED WORKERS	-0.2	-0.2	-4.0	-4.7
Weavers	0.0	0.0	-0.6	-0.6
TAILORS, FURRIERS, UPHOLST- ERERS AND RELATED WORKERS	1.0	1.0	21.4	18.9
Dressmakers Not in Factory	0.5	0.6	5.1	5.6
Upholsterers	0.1	0.1	0.8	0.7
CARPENTERS, CABINETMAKERS, SAWYERS AND RELATED WORKERS	7.1	6.0	16.2	14.1
Carpenters	5.2	4.4	8.6	7.3
Sawyers	0.9	0.8	1.9	1.7
Inspectors, Log & Lumber	0.1	0.1	0.8	0.7

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
3.6	3.3	0.6	0.6	0.3	0.4	5.5	5.2
0.5	0.4	0.1	0.1	0.1	0.1	0.6	0.6
0.8	0.8	0.3	0.4	0.3	0.3	2.0	2.0
6.3	5.7	0.4	0.4	0.2	0.2	13.5	12.1
0.5	0.5	0.1	0.1	0.0	0.0	1.2	1.1
5.6	5.1	0.1	0.1	0.1	0.1	12.2	10.9
0.3	0.3	0.2	0.2	0.2	0.2	0.7	0.9
-0.7	-1.2	0.0	0.0	-0.1	-0.1	-4.1	-5.4
-0.1	-0.1	0.0	0.0	0.0	0.0	-0.4	-0.6
19.2	17.5	6.1	5.4	2.0	2.0	52.9	47.7
4.0	4.2	1.4	1.6	1.2	1.4	11.8	12.7
2.0	1.8	0.6	0.5	0.2	0.2	3.6	3.3
23.7	21.3	10.8	8.9	14.0	12.5	74.0	64.8
12.6	11.2	8.1	6.6	5.0	4.4	39.9	34.2
2.2	2.0	0.6	0.5	3.8	3.4	10.2	9.2
0.7	0.6	0.2	0.1	2.2	2.0	4.2	3.7

APPENDIX TABLE II.1 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
PRINTERS, BOOKBINDERS AND RELATED WORKERS	1.1	0.9	10.5	9.7
Compositors & Typesetters	0.4	0.3	2.5	2.3
Photoengravers, Pressmen	0.5	0.4	5.9	5.5
Pressmen, Printing	0.4	0.4	4.2	3.9
Lithographic Occ.	0.1	0.1	1.3	1.2
Photoengravers	0.1	0.1	0.5	0.4
Bookbinders	0.1	0.1	1.3	1.2
Other Occ. in Bookbind.	0.0	0.0	0.2	0.2
Printing Workers, nes	0.0	0.0	0.7	0.6
FURNACEMEN, MOULDERS, BLACKSMITHS AND RELATED METAL WORKERS	0.6	0.5	3.2	2.8
Heat Treaters, Etc.	0.0	0.0	0.1	0.1
Rolling Mill Operators	0.2	0.1	0.3	0.3
Blacksmiths, Etc.	0.0	0.0	0.1	0.1
Coremakers	0.0	0.0	0.0	0.0
JEWELLERS, WATCHMAKERS AND ENGRAVERS	0.1	0.1	1.2	1.2
Engravers, Exc. Photoeng.	0.0	0.0	0.1	0.1
MACHINISTS, PLUMBERS, SHEET METAL WORKERS AND RELATED WORKERS	9.1	8.1	40.0	36.6
Toolmakers, Diemakers	0.0	0.0	0.9	0.8
Filers, Grinders, Etc.	0.1	0.1	0.5	0.4
Millwrights	-0.8	-0.9	1.7	1.5
Fitters & A., nes, Metal	0.2	0.2	1.4	1.2

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
22.4	20.6	4.4	3.8	2.3	2.1	39.7	36.3
5.3	4.8	1.5	1.3	0.7	0.6	10.1	9.0
12.7	11.8	2.1	1.8	1.2	1.1	21.9	20.2
8.0	7.4	1.6	1.4	0.8	0.7	14.8	13.7
3.4	3.1	0.4	0.4	0.3	0.3	5.1	4.8
1.3	1.2	0.1	0.1	0.1	0.1	2.0	1.8
1.8	1.6	0.4	0.4	0.2	0.2	3.6	3.3
1.0	0.9	0.2	0.2	0.1	0.1	1.4	1.3
1.8	1.6	0.2	0.2	0.1	0.1	2.7	2.5
9.8	8.7	1.3	1.1	1.2	1.1	15.8	13.8
0.8	0.7	0.0	0.0	0.1	0.1	0.9	0.8
1.9	1.8	0.2	0.2	0.0	0.0	2.4	2.2
0.1	0.1	0.1	0.1	0.0	0.0	0.6	0.5
0.2	0.2	0.1	0.1	0.0	0.0	0.2	0.1
1.2	1.2	0.3	0.3	0.3	0.3	3.0	3.1
0.3	0.2	0.1	0.1	0.0	-0.1	0.5	0.4
97.6	89.1	22.6	20.6	15.0	13.8	181.6	165.5
6.3	5.6	0.2	0.1	0.1	0.1	6.7	6.0
2.5	2.2	0.2	0.2	0.4	0.4	3.4	3.1
5.1	4.6	0.7	0.6	1.8	1.6	8.5	7.5
9.5	8.5	0.4	0.4	0.2	0.2	10.8	9.5

APPENDIX TABLE II.1 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
Plumbers & Pipefitters	2.3	2.0	6.8	6.1
Sheet Metal Workers	0.5	0.4	2.2	1.9
Riveters & Rivet Heaters	0.0	0.0	0.0	-0.1
Boilermakers, Etc.	1.0	0.9	2.3	2.0
Welders & Flame Cutters	3.3	3.1	15.6	14.9
Polishers & Buffers, Metal	0.0	0.0	0.1	0.0
MECHANICS AND REPAIRMEN, ELECTRICIANS AND RELATED ELECTRICAL AND ELECTRONICS WORKERS	17.6	18.2	74.0	75.4
Mechanics & R., Aircraft	0.5	0.5	4.3	4.4
Mechanics & R., Motor Veh.	3.9	4.5	21.4	23.2
Mechanics & R., Railroad	0.0	0.0	0.1	0.2
Power Station Operators	0.3	0.3	0.5	0.4
Projectionists, Mot. Pic.	0.0	0.1	0.3	0.3
Linemen	2.4	2.5	6.2	6.6
Fitters, nes	0.1	0.1	2.2	1.9
Fitters	0.1	0.1	1.9	1.6
Electrical Workers, nes	0.0	0.0	0.2	0.2
PAINTERS, PAPERHANGERS AND GLAZIERS	1.7	1.6	5.4	5.2
BRICKLAYERS, PLASTERERS AND CONSTRUCTION WORKERS, NES	4.5	4.2	16.1	14.7
General Foremen, Constn.	2.0	1.9	4.5	4.2
Inspectors, Construction	0.4	0.4	2.2	2.2
Bricklayers, Etc.	1.3	1.2	4.7	4.1
Bricklayers, Etc.	1.2	1.0	3.6	3.1
Cement and Concrete Fin.	0.3	0.2	1.1	1.0
Plasterers & Lathers	0.2	0.2	1.8	1.6

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
9.2	8.4	4.6	3.9	2.5	2.3	26.4	23.7
4.6	4.2	2.4	2.0	1.1	1.0	10.6	9.3
0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
3.4	3.1	1.1	1.0	1.5	1.3	9.4	8.6
27.7	26.0	10.7	10.2	5.5	5.2	62.4	58.9
0.6	0.5	0.1	0.1	0.0	0.0	0.6	0.5
112.3	110.0	42.1	43.0	26.9	27.5	275.5	276.5
1.7	1.7	2.3	2.4	1.4	1.5	10.3	10.6
25.9	26.6	11.1	12.2	5.5	6.0	67.5	72.1
0.5	0.6	0.0	0.0	0.1	0.2	0.6	0.9
0.8	0.7	0.3	0.3	0.3	0.2	2.1	1.9
0.3	0.4	0.2	0.2	0.2	0.2	1.1	1.2
8.6	9.1	4.1	4.5	3.2	3.3	24.3	25.9
8.6	7.7	0.3	0.3	0.2	0.2	10.8	9.5
7.3	6.6	0.4	0.3	0.2	0.2	9.3	8.3
1.2	1.1	0.1	0.1	0.1	0.1	1.5	1.3
9.7	9.1	3.2	2.9	2.2	2.1	22.3	20.9
27.7	25.9	12.3	10.8	6.6	6.1	67.9	62.2
7.0	6.6	4.8	4.3	2.0	1.9	20.0	18.7
2.7	2.8	1.2	1.2	0.8	0.8	7.1	7.3
10.1	9.2	3.3	2.8	1.4	1.3	21.4	18.9
7.9	7.2	2.0	1.7	0.9	0.8	15.9	14.0
2.2	2.0	1.3	1.1	0.5	0.4	5.4	4.8
3.7	3.4	1.9	1.6	1.1	1.0	8.7	7.7

APPENDIX TABLE II.1 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
CLAY, GLASS AND STONE WORKERS	0.3	0.2	3.4	3.1
Lens Grinders, Etc.	0.0	0.0	0.4	0.4
Furnacemen, Etc., C. & G.	0.1	0.1	0.1	0.1
Stone Cutters & Dressers	0.0	0.0	0.1	0.0
STATIONARY ENGINE AND EXCAVATING AND LIFTING EQUIPMENT OPERATORS AND RELATED WORKERS	9.4	8.8	20.0	19.0
Boiler Firemen (exc. ship)	0.6	0.6	1.2	1.2
Stationary Enginemen	1.4	1.3	4.2	4.2
Motormen (veh.) Exc. Rail	0.2	0.2	0.2	0.2
Hoistmen, Etc., nes	6.2	5.8	11.5	10.8
Hoistmen, Etc.	1.6	1.5	3.3	3.1
Operators, nes	4.8	4.5	8.1	7.6
LONGSHOREMEN AND STEVEDORES	-0.4	-0.3	-0.4	-0.1
SECTIONMEN AND TRACKMEN	-0.4	-0.3	-0.4	-0.2
OTHER PRODUCTION PROCESS AND RELATED WORKERS	3.4	2.8	22.5	19.6
Tobacco Preparers, Etc.	0.0	0.0	1.4	1.2
Patternmakers (exc. paper)	0.0	0.0	0.2	0.1
Paper Products Makers	0.2	0.2	2.3	2.1
Photographic Proc. Occ.	0.1	0.1	0.8	0.9
Inspectors, Etc., nes, M.	0.3	0.3	2.2	2.0
Inspectors, Etc., nes	0.2	0.2	0.5	0.5

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
6.5	5.9	1.4	1.2	0.5	0.5	11.9	10.9
0.0	0.0	0.3	0.3	0.1	0.2	1.8	1.7
0.7	0.6	0.1	0.1	0.1	0.1	0.9	0.8
0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.2
40.4	37.8	23.7	21.9	15.7	14.4	106.6	99.6
0.7	0.7	0.5	0.5	0.2	0.2	3.6	3.5
9.5	9.1	3.1	2.9	2.5	2.5	20.5	19.9
0.7	0.4	0.3	0.3	0.2	0.1	1.7	1.3
24.8	23.2	11.7	10.6	8.7	8.0	62.5	58.2
10.2	9.4	2.0	1.8	3.2	2.9	19.6	18.1
14.6	13.9	9.7	8.8	5.5	5.1	42.7	39.9
0.0	0.0	0.0	0.0	0.2	0.3	-0.3	0.2
-0.4	-0.2	-0.8	-0.3	0.0	0.1	-1.7	-0.6
52.4	47.0	10.2	9.3	6.6	6.3	95.0	84.7
0.6	0.5	0.0	0.0	0.0	0.0	2.3	2.0
0.6	0.5	0.1	0.1	0.0	0.0	0.8	0.7
5.8	5.3	0.7	0.6	0.4	0.4	9.2	8.3
2.0	2.0	0.6	0.6	0.4	0.4	3.9	4.0
8.0	7.3	0.8	0.7	0.4	0.4	11.1	10.1
0.9	0.9	1.0	0.9	0.3	0.3	2.7	2.6

APPENDIX TABLE II.1 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
<u>LABOURERS (INCL. WAREHOUSEMEN AND FREIGHT HANDLERS, N.E.S.)</u>	3.2	2.9	12.4	12.1
Labourers	2.7	2.2	11.0	10.5
Warehousemen, n.e.s.	0.5	0.7	1.3	1.7
<u>ALL OCCUPATIONS</u>	217.3	220.4	1,112.0	1,136.7

Thousands

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
27.0	25.3	14.5	13.0	6.8	6.3	61.9	57.9
24.7	22.9	12.9	11.2	5.3	4.7	54.5	49.7
2.3	2.4	1.7	1.9	1.4	1.5	7.4	8.2
1,703.6	1,674.8	625.6	604.0	423.3	434.3	4,081.8	4,070.2

REQUIRED MANPOWER INFLOW, 1961-75, AS A PROPORTION OF PROJECTED

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
<u>MANAGERIAL OCCUPATIONS</u>	33.6	35.8	47.3	48.3
<u>PROFESSIONAL AND TECHNICAL OCCUPATIONS</u>	54.2	57.1	63.1	64.2
PROFESSIONAL ENGINEERS	55.1	55.1	62.3	62.3
Civil (incl. surveyors)	53.6	53.6	65.5	66.1
Mechanical	55.6	50.0	62.0	61.4
Mechanical	57.1	57.1	61.2	60.4
Industrial	50.0	50.0	63.6	63.6
Electrical	42.9	42.9	54.2	54.2
Chemical	100.0	100.0	57.1	53.8
BIOLOGISTS AND AGRICULTURAL PROFESSIONALS	55.6	50.0	68.6	68.6
Veterinarians	0.0	0.0	50.0	50.0
TEACHERS	53.2	57.2	62.8	64.4
Professors	64.7	68.4	71.4	72.5
School Teachers	52.2	56.3	61.8	63.5
HEALTH PROFESSIONALS	55.1	58.7	64.6	66.0
Physicians & Surgeons	56.0	59.3	64.4	66.0
Dentists	40.0	40.0	56.5	58.3
Nurses, Graduate	53.7	57.3	63.0	64.4
Nurses-in-Training	48.9	54.0	60.0	61.8
Osteopaths	100.0	100.0	66.7	66.7
Medical & D. Technicians	72.7	75.0	77.9	78.6

TABLE II.2

MANPOWER REQUIREMENTS BY OCCUPATION CLASS BY REGION, 1975

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
48.7	48.6	44.3	44.9	45.9	47.4	46.4	47.0
63.8	64.1	62.5	63.2	65.9	66.8	63.0	63.8
64.9	64.1	63.4	62.7	68.0	67.6	63.6	63.2
63.8	64.1	65.0	65.0	68.4	68.4	64.2	64.6
66.9	65.7	61.1	61.1	68.8	70.6	64.2	63.2
66.7	65.5	61.5	58.3	66.7	66.7	64.3	63.3
67.3	66.0	66.7	60.0	75.0	75.0	64.7	63.4
60.8	59.7	54.5	54.5	55.6	55.6	56.9	56.0
58.6	57.1	66.7	60.0	50.0	50.0	59.3	56.9
65.9	65.9	67.6	67.6	66.7	66.7	67.4	66.9
37.5	28.6	40.0	25.0	50.0	50.0	42.1	38.9
63.0	64.0	61.2	62.5	65.7	67.0	61.9	63.4
72.0	72.9	71.4	73.0	72.7	73.9	71.1	72.2
62.2	63.2	60.3	61.6	64.7	66.2	61.0	62.5
63.8	64.7	62.6	63.8	65.9	67.3	63.4	64.7
63.9	64.9	62.3	63.9	66.7	68.0	63.6	64.9
56.4	57.5	53.3	53.3	58.3	58.3	56.4	57.7
62.1	63.1	60.9	62.0	64.8	66.1	61.9	63.3
60.4	61.3	58.1	59.4	84.4	85.1	59.3	60.9
66.7	66.7	60.0	60.0	66.7	75.0	70.4	71.4
78.4	78.6	77.1	77.7	79.6	80.0	78.0	78.5

APPENDIX TABLE II.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
LAW PROFESSIONALS	50.0	54.5	58.5	60.3
Judges & Magistrates	0.0	0.0	50.0	50.0
Lawyers & Notaries	44.4	50.0	58.7	60.0
RELIGION PROFESSIONALS	44.0	48.1	55.0	57.0
Clergymen, n.o.r.	48.5	52.8	58.4	60.4
Nuns & Brothers, n.o.r.	38.5	42.9	54.2	56.1
ARTISTS, WRITERS AND MUSICIANS	48.0	50.0	58.1	59.2
Artists & Art Teachers	33.3	33.3	60.9	61.7
Commercial	0.0	0.0	52.2	52.2
Except Commercial	50.0	50.0	69.6	70.8
Authors	58.3	58.3	61.5	62.5
Musicians	40.0	45.5	52.7	54.4
OTHER PROFESSIONALS	59.0	59.8	65.5	65.8
Architects	66.7	66.7	78.1	79.4
Draughtsmen	46.2	41.7	50.6	50.6
Actuaries	50.0	50.0	75.0	75.0
Librarians	50.0	60.0	64.7	66.7
Interior Decorators	50.0	50.0	65.2	66.7
Photographers	50.0	66.7	55.0	55.0
<u>CLERICAL OCCUPATIONS</u>	38.9	41.2	49.7	50.9
Office Appliance Oper.	71.4	72.4	79.6	80.0
Shipping & R. Clerks	28.1	30.3	41.2	40.6
Baggagemen, Transport	0.0	50.0	20.0	33.3

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
57.3	58.2	55.6	56.8	60.0	61.5	56.5	58.0
33.3	33.3	50.0	50.0	0.0	0.0	33.3	33.3
58.1	59.6	55.9	57.1	62.5	64.0	57.5	59.0
55.8	56.9	54.7	56.2	60.6	61.8	54.5	56.3
58.6	59.6	57.8	59.1	61.5	63.0	58.3	59.9
52.8	54.1	50.0	53.8	50.0	50.0	52.8	54.5
59.9	60.1	55.8	57.0	59.6	61.0	58.0	58.9
63.5	63.5	60.0	60.0	61.5	64.3	60.8	61.3
58.0	58.0	60.0	55.6	50.0	57.1	55.1	55.1
70.8	70.8	60.0	60.0	71.4	71.4	70.0	71.0
63.6	63.6	61.8	61.8	64.0	65.4	62.5	62.7
51.4	52.6	48.3	50.0	52.6	55.0	50.0	52.1
65.8	65.5	66.5	66.0	67.8	68.0	66.1	66.1
79.5	80.0	80.0	80.0	83.3	84.6	78.0	78.6
54.6	53.8	55.1	54.2	56.3	56.3	53.7	53.2
75.5	75.0	71.4	71.4	75.0	75.0	75.3	75.6
63.2	64.1	63.6	66.7	66.7	66.7	63.3	64.6
65.9	66.7	58.3	58.3	66.7	70.0	57.3	59.0
59.3	59.3	55.6	55.6	57.1	57.1	56.3	57.6
49.3	49.3	47.5	49.0	50.3	52.3	58.6	49.5
80.1	80.0	75.1	75.7	77.8	78.8	78.7	79.0
49.5	48.1	42.9	42.3	40.7	41.8	44.6	43.8
33.3	33.3	20.0	20.0	0.0	0.0	26.3	30.0

APPENDIX TABLE II.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
Ticket Agents, Transport	12.5	22.2	26.3	33.3
Stenographers	41.4	43.6	54.0	55.1
Stenographers	42.9	45.4	54.5	55.5
Typists	35.3	38.9	52.0	53.0
Attendants, D. & D. Off.	66.7	66.7	55.6	60.0
<u>SALES OCCUPATIONS</u>	29.2	33.3	46.3	48.0
Foremen, Trade	42.9	42.9	53.7	55.8
Auctioneers	0.0	0.0	0.0	0.0
Canvassers	23.1	23.1	36.2	37.5
Sales Clerks	28.0	33.0	45.6	47.9
Sales Clerks	20.7	26.0	41.5	43.9
Service Station Att.	68.9	71.4	76.3	77.5
Advertising Salesmen	75.0	75.0	70.0	70.0
Insurance Salesmen	36.8	40.0	40.4	43.5
Real Estate Salesmen	66.7	66.7	60.0	62.2
Security Salesmen	0.0	0.0	33.3	37.5
Brokers, nes	66.7	66.7	63.0	64.3
<u>SERVICE AND RECREATION OCCUPATIONS</u>	42.0	45.9	55.8	57.4
PROTECTIVE SERVICE OCCUPATIONS	43.8	43.8	61.2	61.5
Firemen, Fire Protection	42.9	42.9	65.8	65.8
Policemen & Detectives	42.4	40.6	65.4	65.7
Guards, Watchmen, nes	45.2	46.5	55.9	56.3

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
30.0	34.4	27.3	33.3	33.3	38.5	28.6	34.3
53.8	54.0	50.7	51.6	54.5	56.3	52.8	53.7
55.1	55.3	51.7	52.5	55.7	57.3	53.8	54.6
50.0	50.1	47.3	48.5	50.7	52.8	49.3	50.2
55.9	57.1	57.1	57.1	60.0	60.0	56.0	57.1
47.4	47.7	40.1	42.2	42.1	45.3	44.3	45.7
54.1	54.7	50.0	51.9	45.5	50.0	51.5	53.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44.7	43.2	36.4	36.4	35.0	38.1	38.9	38.9
44.3	45.2	36.4	39.4	39.7	43.4	41.8	44.0
37.6	38.6	29.1	32.3	32.4	36.4	35.6	37.9
74.6	75.1	71.3	72.9	73.0	75.0	73.7	74.8
73.8	73.8	75.0	75.0	75.0	75.0	71.8	71.8
37.4	39.2	37.8	40.4	34.5	40.6	35.1	38.2
56.0	57.4	54.8	57.6	55.6	61.0	57.5	59.5
28.0	30.8	28.6	37.5	28.6	37.5	31.0	34.4
63.3	64.0	64.0	64.0	64.3	64.3	62.2	63.1
55.1	56.0	53.4	54.7	56.8	58.4	54.3	55.7
52.1	52.0	57.2	56.8	54.5	54.8	55.1	55.1
51.3	50.6	55.8	54.8	55.6	55.6	55.6	55.4
51.5	51.5	56.3	56.3	53.5	54.5	55.8	55.9
52.8	52.6	59.4	59.4	54.7	55.6	54.1	54.2

APPENDIX TABLE II.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
HOUSEKEEPERS, WAITERS, COOKS AND RELATED WORKERS	35.9	41.0	50.1	52.2
Housekeepers	47.8	52.0	57.8	60.2
Cooks	42.4	46.0	58.0	59.7
Waiters	46.0	50.0	52.5	54.5
Waiters & Waitresses	45.7	50.0	51.4	53.5
Bartenders	40.0	50.0	58.8	60.4
Nursing Assistants & Aides	68.5	71.2	74.7	75.8
Porters, Baggage & Pullman	20.0	20.0	31.3	35.3
Baby Sitters, nes	-23.3	-13.6	-14.6	-10.0
Baby Sitters	-25.0	-25.0	-23.1	-14.3
Maids, nes	-23.2	-13.2	-14.3	-9.9
ATHLETES, ENTERTAINERS AND RELATED WORKERS	70.0	72.7	72.2	73.2
Actors	66.7	66.7	70.4	71.4
Athletes & Sports Offils.	71.4	75.0	74.1	75.0
OTHER SERVICE OCCUPATIONS	53.2	56.3	62.2	63.6
Barbers, Hairdrs., Manic.	10.7	19.4	26.3	29.4
Launderers & Dry Cleaners	54.2	57.7	64.9	66.4
Elevator Tenders, Bldg.	50.0	50.0	50.0	51.6
Janitors & Cleaners, Bldg.	62.9	65.1	69.7	70.8
Funeral Dir. & Embalmers	50.0	50.0	54.5	54.5
Guides	33.3	33.3	53.3	53.3
<u>TRANSPORT AND COMMUNICATION OCCUPATIONS</u>	34.6	35.8	44.5	46.5
AIR PILOTS, NAVIGATORS AND FLIGHT ENGINEERS	50.0	66.7	72.7	75.0

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
50.3	51.6	47.3	49.0	52.7	54.5	49.2	51.0
59.0	60.0	56.1	57.6	59.0	61.0	57.2	59.0
59.7	60.8	56.1	57.1	58.8	59.8	57.2	58.6
52.1	53.3	49.6	51.3	54.3	56.4	51.3	53.1
51.2	52.4	47.8	49.6	53.4	55.2	50.3	52.1
61.1	61.8	57.5	58.5	60.0	61.5	59.2	60.6
74.7	75.4	73.3	74.2	75.6	76.6	74.3	75.3
36.4	39.1	33.3	33.3	40.0	40.0	35.0	39.1
-13.0	-10.1	-19.9	-16.6	-3.7	-0.9	-15.6	-11.7
-18.4	-15.4	-25.0	-25.0	-16.7	-7.7	-22.2	-17.0
-12.1	-9.5	-18.3	-15.3	-3.2	0.0	-15.1	-11.2
73.4	74.4	72.7	73.9	73.9	75.0	72.7	73.8
73.3	74.2	71.4	71.4	70.0	70.0	71.1	72.5
74.0	74.5	73.3	73.3	78.6	78.6	74.1	75.0
62.0	62.8	61.5	62.7	63.8	65.3	61.4	62.6
26.7	28.6	23.2	25.4	25.6	29.3	25.1	27.9
63.8	64.8	61.5	62.7	66.2	67.5	63.4	64.7
48.3	48.3	40.0	40.0	42.9	50.0	48.1	49.4
69.4	69.8	68.8	69.7	70.8	72.0	69.1	70.0
52.6	55.0	57.1	57.1	50.0	50.0	55.6	57.4
57.7	57.7	50.0	50.0	50.0	50.0	55.1	56.9
47.3	47.9	40.9	42.7	46.0	47.4	44.1	45.4
75.0	76.2	69.2	71.4	80.0	81.0	73.7	75.6

APPENDIX TABLE II.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
OPERATORS, RAILROAD	-33.3	-26.3	-37.9	-29.0
Locomotive Engineers	-40.0	-40.0	-42.9	-42.9
Locomotive Firemen	-200.0	-200.0	-150.0	-66.7
Conductors, Railroad	-33.3	-33.3	-33.3	-14.3
Brakemen, Switch. & Sig.	-11.1	-11.1	-30.8	-13.3
OPERATORS, WATER TRANSPORT	14.6	14.6	19.0	22.7
Deck & Engrg. Off., Ship	6.3	6.3	5.9	15.8
Deck Ratings (ship)	15.8	15.8	21.1	25.0
Engine-room Ratings, Ship	33.3	42.9	20.0	33.3
OPERATORS, ROAD TRANSPORT	46.2	47.0	49.1	50.5
Bus Drivers	70.5	72.9	55.1	59.3
Taxi Drivers & Chauffeurs	22.7	26.1	29.7	35.5
OTHER TRANSPORT OCCUPATIONS	-26.7	-26.7	-12.8	-4.8
Operators, E. S. Railway	0.0	0.0	0.0	0.0
OTHER COMMUNICATION OCCUPATIONS	23.2	27.4	42.8	46.0
Radio & TV Announcers	75.0	75.0	62.5	66.7
Telephone Operators	29.7	33.3	50.3	52.3
Telegraph Operators	-25.0	-25.0	0.0	0.0
Postmen & Mail Carriers	15.4	21.4	25.0	32.5
<u>FARMERS AND FARM WORKERS</u>	-23.8	-61.6	-23.3	-34.2
Farmers & Stockraisers	-50.0	-109.6	-44.3	-59.3

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
-27.9	-21.9	-47.1	-35.1	-26.7	-18.8	-35.5	-27.3
-16.7	-16.7	-44.4	-30.0	-25.0	-25.0	-33.3	-27.3
-83.3	-83.3	-133.3	-133.3	-50.0	-50.0	-86.7	-75.0
-30.8	-21.4	-28.6	-28.6	-33.3	-33.3	-34.4	-26.5
-12.0	-7.7	-40.0	-31.3	-16.7	-16.7	-25.8	-16.9
26.3	28.2	25.0	25.0	28.6	30.2	23.4	25.6
14.3	14.3	0.0	0.0	21.7	21.7	14.1	17.6
33.3	33.3	33.3	33.3	31.3	31.3	26.3	28.2
33.3	42.9	0.0	0.0	66.7	75.0	43.5	45.8
54.3	54.4	49.5	50.3	52.6	53.4	51.2	51.9
62.1	64.0	63.6	66.0	67.4	68.8	62.9	65.2
38.7	41.0	28.6	34.8	35.3	38.9	31.8	36.0
-1.6	1.5	-3.8	3.6	11.1	11.1	-4.9	0.0
-12.5	-12.5	0.0	0.0	0.0	0.0	-25.0	-11.1
42.1	44.0	32.4	36.4	39.8	43.2	37.5	40.5
66.7	66.7	62.5	62.5	66.7	75.0	64.7	67.6
50.4	51.5	36.2	39.4	46.9	49.0	45.5	47.6
9.1	9.1	0.0	14.3	25.0	25.0	0.0	8.3
30.4	35.0	25.0	31.8	37.5	41.2	28.4	34.0
-2.6	-13.1	-6.7	-24.4	28.0	21.6	-7.6	-21.9
-22.4	-37.8	-16.6	-37.2	10.2	-11.5	-23.5	-42.5

APPENDIX TABLE II.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
Farm Managers & Foremen	33.3	0.0	25.0	25.0
Farm Labourers	-19.0	-59.3	-23.5	-35.3
Gardeners (exc. farm)	46.7	44.8	54.3	53.8
Gardeners (exc. farm)	48.0	48.0	52.8	52.8
Other Agricultural Occ.	60.0	50.0	62.5	60.0
<u>LOGGERS AND RELATED WORKERS</u>	-59.1	-75.0	-75.2	-96.0
Forest Rangers & Cruisers	33.3	33.3	30.8	25.0
<u>FISHERMEN, TRAPPERS AND HUNTERS</u>	11.0	-31.7	-162.5	-200.0
Fishermen	11.5	-30.9	-157.1	-260.0
Trappers & Hunters	0.0	0.0	-200.0	-200.0
<u>MINERS, QUARRYMEN AND RELATED WORKERS</u>	23.3	16.8	11.5	3.8
Prospectors	0.0	0.0	0.0	0.0
<u>CRAFTSMEN, PRODUCTION PROCESS AND RELATED WORKERS</u>	42.5	40.8	40.1	38.6
MILLERS, BAKERS, BREWERS AND RELATED FOOD WORKERS	48.9	45.3	50.6	49.7
Millers of Flour & Grain	100.0	100.0	40.0	40.0
Fruit & Veg. Canners	66.7	66.7	60.0	55.6

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
28.6	23.1	36.4	30.0	50.0	50.0	32.4	24.2
-3.2	-15.1	-2.4	-19.9	24.7	15.2	-5.8	-21.2
54.8	54.1	62.5	60.5	58.5	58.5	56.8	55.9
52.8	52.8	59.7	59.7	58.9	58.9	54.5	54.7
64.1	60.0	67.4	63.2	66.7	62.5	65.2	61.0
-14.7	-26.5	55.9	28.6	21.0	11.3	-17.1	-35.5
47.6	42.1	68.9	50.0	65.2	60.0	51.3	43.6
-75.0	-100.0	-15.0	-53.3	-15.6	-32.1	-4.5	-43.6
-57.1	-83.3	-9.1	-50.0	-19.4	-32.1	-3.0	-41.4
-200.0	-200.0	-33.3	-71.4	0.0	0.0	-28.6	-80.0
10.4	-6.2	40.5	33.0	41.0	32.1	19.5	9.0
0.0	0.0	0.0	0.0	50.0	50.0	14.3	0.0
49.9	48.1	50.9	49.3	49.5	48.3	46.8	45.2
58.0	56.4	51.2	48.7	51.0	50.0	54.2	52.7
50.0	46.2	40.0	40.0	100.0	100.0	45.2	41.4
69.5	67.9	75.0	75.0	64.3	61.5	67.0	65.1

APPENDIX TABLE II.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
TIRE BUILDERS, VULCANIZERS AND OTHER RUBBER WORKERS	50.0	50.0	27.8	25.7
Tire & Tube Builders	0.0	0.0	50.0	50.0
Vulcanizers	50.0	50.0	62.5	62.5
LEATHER CUTTERS, LASTERS, SEWERS AND OTHER LEATHER WORKERS (EXCEPT GLOVE AND GARMENT)	16.7	16.7	36.0	33.1
Leather Cutters	100.0	0.0	33.3	29.4
Shoemakers, Factory, nes	33.3	33.3	47.0	44.1
Shoemakers, Not in Factory	0.0	33.3	18.8	23.5
SPINNERS, WEAVERS, KNITTERS AND RELATED WORKERS	-33.3	-33.3	-30.8	-38.2
Weavers	0.0	0.0	-31.6	-31.6
TAILORS, FURRIERS, UPHOLST- ERERS AND RELATED WORKERS	30.3	30.3	29.6	27.1
Dressmakers Not in Factory	33.3	37.5	48.6	50.9
Upholsterers	50.0	50.0	38.1	35.0
CARPENTERS, CABINETMAKERS, SAWYERS AND RELATED WORKERS	32.6	29.0	28.5	25.8
Carpenters	30.2	26.8	22.6	19.9
Sawyers	39.1	36.4	46.3	43.6
Inspectors, Log & Lumber	20.0	20.0	32.0	29.2

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
42.9	40.7	54.5	54.5	50.0	57.1	40.1	38.8
21.7	18.2	50.0	50.0	100.0	100.0	23.1	23.1
50.0	50.0	42.9	50.0	60.0	60.0	52.6	52.6
46.7	44.2	33.3	33.3	33.3	33.3	41.3	38.7
38.5	38.5	100.0	100.0	0.0	0.0	36.4	34.4
57.1	54.8	50.0	50.0	100.0	100.0	53.5	50.7
21.4	21.4	25.0	25.0	40.0	40.0	15.9	19.6
-8.1	-14.8	0.0	0.0	-50.0	-50.0	-17.5	-24.4
-11.1	-11.1	0.0	0.0	0.0	0.0	-12.5	-20.0
42.1	39.9	40.9	38.0	38.5	38.5	36.7	34.3
48.2	49.4	41.2	44.4	52.2	56.0	46.3	48.1
50.0	47.4	54.5	50.0	33.3	33.3	45.6	43.4
38.9	36.3	39.0	34.5	41.1	38.3	36.4	33.4
31.9	29.4	35.8	31.3	36.8	33.8	30.4	27.3
55.0	52.6	54.5	50.0	48.1	45.3	50.7	48.2
50.0	46.2	66.7	50.0	52.4	50.0	46.2	43.0

APPENDIX TABLE II.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
PRINTERS, BOOKBINDERS AND RELATED WORKERS	47.8	42.9	53.8	51.9
Compositors & Typesetters	36.4	30.0	41.0	39.0
Photoengravers, Pressmen	62.5	57.1	64.8	63.2
Pressmen, Printing	66.7	66.7	64.6	62.9
Lithographic Occ.	100.0	100.0	68.4	66.7
Photoengravers	100.0	100.0	62.5	57.1
Bookbinders	50.0	50.0	52.0	50.0
Other Occ. in Bookbind.	0.0	0.0	40.0	40.0
Printing Workers, nes	0.0	0.0	53.8	50.0
FURNACEMEN, MOULDERS, BLACKSMITHS AND RELATED METAL WORKERS	31.6	27.8	31.1	28.3
Heat Treaters, Etc.	0.0	0.0	33.3	33.3
Rolling Mill Operators	66.7	50.0	60.0	60.0
Blacksmiths, Etc.	0.0	0.0	7.1	7.1
Coremakers	0.0	0.0	0.0	0.0
JEWELLERS, WATCHMAKERS AND ENGRAVERS	33.3	33.3	41.4	41.4
Engravers, Exc. Photoeng.	0.0	0.0	25.0	25.0
MACHINISTS, PLUMBERS, SHEET METAL WORKERS AND RELATED WORKERS	50.3	47.4	46.1	43.9
Toolmakers, Diemakers	0.0	0.0	39.1	36.4
Filers, Grinders, Etc.	50.0	50.0	41.7	36.4
Millwrights	-66.7	-81.8	54.8	51.7
Fitters & A., nes, Metal	33.3	33.3	36.8	33.3

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
61.2	59.2	59.5	55.9	54.8	52.5	57.6	55.4
49.1	46.6	50.0	46.4	43.8	40.0	45.1	42.3
71.8	70.2	72.4	69.2	66.7	64.7	68.9	67.1
71.4	69.8	72.7	70.0	66.7	63.6	68.8	67.2
72.3	70.5	80.0	80.0	60.0	60.0	68.9	67.6
72.2	70.6	50.0	50.0	100.0	100.0	69.0	66.7
54.5	51.6	57.1	57.1	50.0	50.0	52.2	50.0
52.6	50.0	50.0	50.0	50.0	50.0	46.7	44.8
60.0	57.1	66.7	66.7	50.0	50.0	56.3	54.3
45.4	42.4	41.9	37.9	38.7	36.7	39.8	36.6
57.1	53.8	0.0	0.0	100.0	100.0	52.9	50.0
61.3	60.0	66.7	66.7	0.0	0.0	58.5	56.4
6.7	6.7	14.3	14.3	0.0	0.0	13.6	11.6
28.6	28.6	100.0	100.0	0.0	0.0	22.2	12.5
40.0	40.0	37.5	37.5	50.0	50.0	40.0	40.8
50.0	40.0	100.0	100.0	0.0	0.0	41.7	36.4
53.2	50.9	59.9	57.7	55.4	53.3	51.8	49.5
50.8	47.9	66.7	50.0	50.0	50.0	45.9	43.2
46.3	43.1	50.0	50.0	44.4	44.4	43.6	41.3
60.0	57.5	63.6	60.0	56.3	53.3	49.7	46.6
49.0	46.2	57.1	57.1	40.0	40.0	44.8	41.7

APPENDIX TABLE II.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
Plumbers & Pipefitters	48.9	45.5	41.5	38.9
Sheet Metal Workers	41.7	36.4	37.3	33.9
Riveters & Rivet Heaters	0.0	0.0	0.0	-20.0
Boilermakers, Etc.	52.6	50.0	54.8	51.3
Welders & Flame Cutters	67.3	66.0	65.3	64.2
Polishers & Buffers, Metal	0.0	0.0	14.3	0.0
MECHANICS AND REPAIRMEN, ELECTRICIANS AND RELATED ELECTRICAL AND ELECTRONICS WORKERS	50.7	51.6	53.8	54.3
Mechanics & R., Aircraft	62.5	62.5	65.2	65.7
Mechanics & R., Motor Veh.	40.2	43.7	52.5	54.5
Mechanics & R., Railroad	0.0	0.0	5.9	11.1
Power Station Operators	42.9	42.9	31.3	26.7
Projectionists, Mot. Pic.	0.0	50.0	50.0	50.0
Linemen	52.2	53.2	53.4	55.0
Fitters, nes	33.3	33.3	34.4	31.1
Fitters	50.0	50.0	34.5	30.8
Electrical Workers, nes	0.0	0.0	22.2	22.2
PAINTERS, PAPERHANGERS AND GLAZIERS	32.7	31.4	31.6	30.8
BRICKLAYERS, PLASTERERS AND CONSTRUCTION WORKERS, NES	53.6	51.9	48.8	46.5
General Foremen, Constn.	57.1	55.9	55.6	53.8
Inspectors, Construction	66.7	66.7	73.3	73.3
Bricklayers, Etc.	50.0	48.0	43.5	40.2
Bricklayers, Etc.	54.5	50.0	42.9	39.2
Cement and Concrete Fin.	60.0	50.0	45.8	43.5
Plasterers & Lathers	40.0	40.0	46.2	43.2

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
48.4	46.2	52.9	48.8	52.1	50.0	48.4	45.8
46.0	43.8	54.5	50.0	52.4	50.0	45.1	41.9
0.0	0.0	0.0	0.0	0.0	0.0	0.0	-10.0
63.0	60.8	64.7	62.5	60.0	56.5	59.5	57.3
68.4	67.0	73.3	72.3	69.6	68.4	68.3	67.0
30.0	26.3	100.0	100.0	0.0	0.0	22.2	19.2
56.5	56.0	56.4	57.0	58.4	58.9	55.7	55.8
68.0	68.0	69.7	70.6	70.0	71.4	66.9	67.5
52.4	53.1	47.4	49.8	50.0	52.2	50.3	52.0
26.3	30.0	0.0	0.0	25.0	40.0	10.2	14.5
38.1	35.0	37.5	37.5	50.0	40.0	36.2	33.9
42.9	50.0	50.0	50.0	66.7	66.7	52.4	54.5
52.8	54.2	53.2	55.6	58.2	58.9	53.4	55.0
45.7	43.0	42.9	42.9	40.0	40.0	41.5	38.5
47.4	44.9	57.1	50.0	50.0	50.0	42.9	40.1
36.4	34.4	100.0	100.0	100.0	100.0	34.9	31.7
39.0	37.4	38.1	35.8	43.1	42.0	36.7	35.2
55.6	54.0	58.3	55.1	58.9	57.0	54.7	52.2
60.9	59.5	62.3	59.7	62.5	61.3	59.5	57.9
69.2	70.0	70.6	70.6	72.7	72.7	71.0	71.6
52.1	49.7	55.9	51.9	58.3	56.5	51.4	48.3
51.6	49.3	54.1	50.0	56.3	53.3	50.5	47.3
53.7	51.3	59.1	55.0	55.6	50.0	53.5	50.5
55.2	53.1	57.6	53.3	61.1	58.8	53.7	50.7

APPENDIX TABLE II.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
CLAY, GLASS AND STONE WORKERS	42.9	33.3	50.7	48.4
Lens Grinders, Etc.	0.0	0.0	57.1	57.1
Furnacemen, Etc., C. & G.	100.0	100.0	33.3	33.3
Stone Cutters & Dressers	0.0	0.0	12.5	0.0
STATIONARY ENGINE AND EXCAVATING AND LIFTING EQUIPMENT OPERATORS AND RELATED WORKERS	50.8	49.2	51.0	49.7
Boiler Firemen (exc. ship)	40.0	40.0	35.3	35.3
Stationary Enginemen	42.4	40.6	47.2	47.2
Motormen (veh.) Exc. Rail	50.0	50.0	50.0	50.0
Hoistmen, Etc., nes	60.8	59.2	60.5	59.0
Hoistmen, Etc.	61.5	60.0	60.0	58.5
Operators, nes	62.3	60.8	60.0	58.5
LONGSHOREMEN AND STEVEDORES	-16.0	-11.5	-12.9	-2.9
SECTIONMEN AND TRACKMEN	-26.7	-18.8	-18.2	-8.3
OTHER PRODUCTION PROCESS AND RELATED WORKERS	28.1	24.3	28.5	25.8
Tobacco Preparers, Etc.	0.0	0.0	33.3	30.0
Patternmakers (exc. paper)	0.0	0.0	33.3	20.0
Paper Products Makers	50.0	50.0	46.0	43.8
Photographic Proc. Occ.	50.0	50.0	57.1	60.0
Inspectors, Etc., nes, M.	60.0	60.0	44.0	41.7
Inspectors, Etc., nes	33.3	33.3	45.5	45.5

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
59.6	57.3	58.3	54.5	55.6	55.6	55.6	53.4
0.0	0.0	60.0	60.0	50.0	66.7	58.1	56.7
58.3	54.5	50.0	50.0	100.0	100.0	50.0	47.1
20.0	20.0	0.0	100.0	100.0	100.0	18.8	13.3
57.1	55.5	56.6	54.6	55.3	53.1	54.4	52.7
38.9	38.9	45.5	45.5	33.3	33.3	41.9	41.2
49.5	48.4	50.8	49.2	51.0	51.0	48.3	47.6
41.2	28.6	50.0	50.0	66.7	50.0	48.6	41.9
65.6	64.1	67.2	65.0	65.9	64.0	64.3	62.6
66.2	64.4	69.0	66.7	64.0	61.7	63.6	61.8
65.2	64.1	66.9	64.7	67.1	65.4	64.4	62.8
0.0	0.0	0.0	0.0	9.5	13.6	-3.3	2.1
-9.3	-4.4	-15.4	-5.3	0.0	4.5	-11.0	-3.6
40.1	37.5	41.1	38.9	35.7	34.6	35.9	33.3
50.0	45.5	0.0	0.0	0.0	0.0	39.7	36.4
40.0	35.7	100.0	100.0	0.0	0.0	34.8	31.8
58.0	55.8	58.3	54.5	50.0	50.0	53.5	50.9
62.5	62.5	60.0	60.0	66.7	66.7	60.9	61.5
51.6	49.3	66.7	63.6	57.1	57.1	49.8	47.4
42.9	42.9	55.6	52.9	42.9	42.9	43.5	42.6

APPENDIX TABLE II.2 (Cont'd)

	ATLANTIC		QUEBEC	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2
<u>LABOURERS (INCL. WAREHOUSEMEN AND FREIGHT HANDLERS, N.E.S.)</u>	10.0	9.1	13.6	13.3
Labourers	9.6	7.9	13.2	12.6
Warehousemen, n.e.s.	12.8	17.1	17.3	21.5
<u>ALL OCCUPATIONS</u>	34.9	35.2	44.8	45.3

Percentages

ONTARIO		PRAIRIES		BRITISH COLUMBIA		CANADA	
Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
22.9	21.8	28.0	25.8	21.7	20.4	19.2	18.2
22.6	21.3	27.7	24.9	19.8	17.9	18.6	17.3
26.7	27.6	32.7	35.2	30.4	31.9	24.6	26.5
48.9	48.5	42.1	41.3	49.8	50.4	45.7	45.7

PROJECTED COEFFICIENTS OF EMPLOYMENT CONCENTRATION

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
<u>MANAGERIAL OCCUPATIONS</u>	*	*	*	*
<u>PROFESSIONAL AND TECHNICAL OCCUPATIONS</u>	*	*	*	62.9
PROFESSIONAL ENGINEERS	*	*	*	18.9
Civil (incl. surveyors)	*	69.4	*	25.8
Mechanical	*	*	*	26.8
Mechanical	*	*	*	30.4
Industrial	*	*	*	21.9
Electrical	*	*	*	*
Chemical	*	*	*	18.9
BIOLOGISTS AND AGRICULTURAL PROFESSIONALS	7.2	64.5	94.3	*
Veterinarians	1.6	*	*	*
TEACHERS	*	*	*	*
Professors	*	*	*	*
School Teachers	*	*	*	*
HEALTH PROFESSIONALS	*	*	*	*
Physicians & Surgeons	*	*	*	*
Dentists	*	*	*	*
Nurses, Graduate	*	*	*	*
Nurses-in-Training	*	*	*	*
Osteopaths	*	*	*	*
Medical & D. Technicians	*	*	*	*

TABLE III

FOR EACH OCCUPATION CLASS BY INDUSTRY DIVISION

 $\frac{1}{S_{ij}}$

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
5.1	12.2	18.6	*	3.1	10.2	6.1	17.1
8.8	*	35.6	*	55.6	*	1.4	12.5
2.9	32.1	12.5	32.4	30.1	*	3.5	7.9
13.5	19.2	7.6	33.4	*	*	2.4	4.2
1.6	56.5	37.2	71.9	31.8	97.1	5.1	34.0
1.6	48.3	31.6	70.9	29.4	*	4.7	28.3
1.5	86.2	58.8	75.2	39.2	45.0	5.7	59.2
2.0	58.5	7.8	9.9	21.7	*	6.4	18.5
1.3	*	*	*	26.5	*	13.6	14.9
20.3	*	*	*	78.7	*	3.7	2.0
96.2	*	*	*	*	*	18.2	3.4
*	*	*	*	*	*	1.0	89.3
*	*	*	*	*	*	1.0	*
*	*	*	*	*	*	1.0	*
36.6	*	*	*	43.5	*	1.1	39.8
*	*	*	*	*	*	1.0	27.6
*	*	*	*	*	*	1.0	46.1
*	*	*	*	*	*	1.0	30.4
*	*	*	*	*	*	1.0	*
*	*	*	*	*	*	1.0	*
7.5	*	*	*	*	*	1.2	47.8

APPENDIX TABLE III (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
LAW PROFESSIONALS	*	*	*	*
Judges & Magistrates	*	*	*	*
Lawyers and Notaries	*	*	*	*
RELIGION PROFESSIONALS	*	*	*	*
Clergymen, n.o.r.	*	*	*	*
Nuns & Brothers, n.o.r.	*	*	*	*
ARTISTS, WRITERS AND MUSICIANS	*	*	*	*
Artists & Art Teachers	*	*	*	*
Commercial	*	*	*	*
Except Commercial	*	*	*	*
Authors	*	*	*	*
Musicians	*	*	*	*
OTHER PROFESSIONALS	*	*	*	23.8
Architects	*	*	*	*
Draughtsmen	*	*	*	36.9
Actuaries	*	*	*	*
Librarians	*	*	*	*
Interior Decorators	*	*	*	*
Photographers	*	*	*	*
<u>CLERICAL OCCUPATIONS</u>	*	*	*	76.9
Office Appliance Oper.	*	*	*	*
Shipping & R. Clerks	*	*	*	*
Baggagemen, Transport	*	*	*	*

$$\frac{1}{S_{ij}}$$

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
65.4	*	*	*	*	64.1	1.2	11.6
*	*	*	*	*	*	32.6	1.0
62.9	*	*	*	*	61.7	1.1	19.8
*	*	*	*	*	*	1.0	*
*	*	*	*	*	*	1.0	*
*	*	*	*	*	*	1.0	*
4.0	*	10.8	*	31.4	*	1.7	28.0
3.4	*	34.2	*	16.1	*	1.8	22.8
2.2	*	26.2	*	10.3	*	2.8	24.3
16.5	*	63.3	*	*	*	1.2	20.7
2.6	*	5.9	*	29.6	76.9	3.0	20.3
*	*	30.3	*	*	*	1.0	*
4.0	59.2	15.8	78.7	33.0	57.8	2.7	5.2
*	*	83.3	*	*	90.1	1.1	21.9
2.9	27.9	22.1	25.1	39.8	*	3.5	5.1
2.6	*	7.6	35.1	13.2	7.0	9.4	8.0
28.3	*	23.4	*	*	*	1.2	12.3
26.6	*	*	*	1.4	*	4.6	*
5.3	*	44.4	*	79.4	*	1.4	14.7
5.4	56.2	10.7	70.4	5.5	6.8	4.3	9.0
3.4	*	13.6	55.6	8.0	3.7	9.9	9.0
1.7	*	14.9	*	3.5	*	45.7	*
*	*	1.0	*	*	*	*	*

APPENDIX TABLE III (Cont'd)

	Agricul- ture	Forestry	Fishing and Trapping	Mining, Quarry- ing, Oilwells
Ticket Agents, Transport	*	*	*	*
Stenographers	*	*	*	60.6
Stenographers	*	*	*	54.1
Typists	*	*	*	*
Attendants, D. & D. Off.	*	*	*	*
<u>SALES OCCUPATIONS</u>	*	*	*	*
Foremen, Trade	*	*	*	*
Auctioneers	*	*	*	*
Canvassers	*	*	*	*
Sales Clerks	*	*	*	*
Sales Clerks	*	*	*	*
Service Station Att.	*	*	*	*
Advertising Salesmen	*	*	*	*
Insurance Salesmen	*	*	*	*
Real Estate Salesmen	*	*	*	*
Security Salesmen	*	*	*	*
Brokers, nes	*	*	*	18.3
<u>SERVICE AND RECREATION OCCUPATIONS</u>	*	*	*	*
PROTECTIVE SERVICE OCCUPATIONS	*	*	*	*
Firemen, Fire Protection	*	*	*	*
Policemen & Detectives	*	*	86.2	*
Guards, Watchmen, nes	*	*	*	57.1

$$\frac{1}{S_{ij}}$$

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
*	*	1.0	*	*	*	*	*
5.7	47.6	16.7	93.5	10.6	6.7	2.8	8.8
6.0	42.9	18.7	95.2	11.0	7.2	2.5	10.0
5.1	77.5	12.2	87.7	9.4	5.4	4.3	6.1
*	*	*	*	*	*	1.1	13.0
5.4	*	60.2	*	1.6	10.1	22.8	*
8.1	*	*	*	1.2	*	63.7	*
*	*	23.0	*	1.1	*	*	48.3
2.4	*	55.9	84.7	2.3	*	9.6	*
14.9	*	*	*	1.1	*	25.9	*
12.8	*	*	*	1.2	*	22.1	*
*	*	*	*	1.0	*	*	*
1.8	*	4.0	*	39.4	*	6.0	*
*	*	*	*	*	1.1	10.3	*
*	78.7	*	*	*	1.0	*	*
*	*	*	*	85.5	1.0	55.2	*
10.6	93.5	4.9	32.5	9.3	5.8	4.7	9.3
29.8	*	50.8	*	31.4	59.5	1.3	10.5
11.0	38.6	44.1	*	47.8	*	4.9	1.6
18.0	*	*	*	*	*	*	1.1
*	*	62.9	*	*	*	11.0	1.2
5.6	17.0	28.4	*	23.6	*	2.6	3.9

APPENDIX TABLE III (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
HOUSEKEEPERS, WAITERS, COOKS AND RELATED WORKERS	*	*	*	*
Housekeepers	*	*	*	*
Cooks	*	93.5	*	*
Waiters	*	*	*	*
Waiters & Waitresses	*	*	*	*
Bartenders	*	*	*	*
Nursing Assistants & Aides	*	*	*	*
Porters, Baggage & Pullman	*	*	*	*
Baby Sitters, nes	*	94.3	*	*
Baby Sitters	*	*	*	*
Maids, nes	*	87.0	*	*
ATHLETES, ENTERTAINERS AND RELATED WORKERS	*	*	*	*
Actors	*	*	*	*
Athletes & Sports Offils.	*	*	*	*
OTHER SERVICE OCCUPATIONS	*	*	*	*
Barbers, Hairdrs., Manic.	*	*	*	*
Launderers & Dry Cleaners	*	*	*	*
Elevator Tenders, Bldg.	*	*	*	*
Janitors & Cleaners, Bldg.	*	*	*	*
Funeral Dir. & Embalmers	*	*	*	*
Guides	*	*	*	*
<u>TRANSPORT AND COMMUNICATION OCCUPATIONS</u>	*	*	*	78.7
AIR PILOTS, NAVIGATORS AND FLIGHT ENGINEERS	*	*	*	70.9

$$\frac{1}{S_{ij}}$$

Manufac- turing	Construc- tion	Transportation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
85.5	*	60.6	*	47.2	*	1.1	61.3
55.2	*	11.9	*	56.5	*	1.2	52.1
45.0	*	39.5	*	42.6	*	1.2	34.0
71.4	*	78.7	*	17.5	*	1.1	41.8
65.4	*	71.9	*	15.6	*	1.1	39.7
*	*	*	*	*	*	1.0	70.9
*	*	*	*	*	*	1.0	*
*	*	2.2	*	*	74.1	1.9	*
64.9	*	96.2	*	44.6	*	1.1	52.4
*	*	*	*	*	*	1.0	*
59.5	*	88.5	*	41.0	*	1.1	48.5
*	*	24.6	*	*	*	1.1	36.4
*	*	10.2	*	*	*	1.1	*
*	*	*	*	*	*	1.1	22.0
19.3	87.0	43.5	*	18.6	22.8	1.3	16.8
*	*	*	*	31.6	*	1.0	*
*	*	*	*	*	*	1.0	*
7.0	98.0	28.8	*	8.0	10.0	2.1	9.6
13.4	56.2	29.5	*	13.5	15.1	1.6	11.8
*	*	*	*	*	*	1.0	*
82.0	*	65.4	*	*	*	1.1	25.7
4.5	18.6	2.5	76.3	7.2	*	10.2	22.0
54.1	*	1.1	*	*	*	57.8	98.0

APPENDIX TABLE III (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
OPERATORS, RAILROAD	*	*	*	55.9
Locomotive Engineers	*	*	*	26.6
Locomotive Firemen	*	*	*	58.5
Conductors, Railroad	*	*	*	62.1
Brakemen, Switch. & Sig.	*	*	*	*
OPERATORS, WATER TRANSPORT	*	35.6	47.4	*
Deck & Engrg. Off., Ship	*	66.2	33.8	*
Deck Ratings (ship)	*	20.8	51.8	*
Engine-room Ratings, Ship	*	*	*	*
OPERATORS, ROAD TRANSPORT	*	*	*	65.4
Bus Drivers	*	*	*	*
Taxi Drivers & Chauffeurs	*	*	*	*
OTHER TRANSPORT OCCUPATIONS	*	55.9	*	93.5
Operators, E. S. Railway	*	*	*	*
OTHER COMMUNICATION OCCUPATIONS	*	*	*	*
Radio & TV Announcers	*	*	*	*
Telephone Operators	*	*	*	*
Telegraph Operators	*	*	*	*
Postmen & Mail Carriers	*	*	*	*
<u>FARMERS AND FARM WORKERS</u>	1.1	*	*	*
Farmers & Stockraisers	1.0	*	*	*

$$\frac{1}{S_{ij}}$$

Manufac- turing	Construc- tion	Transportation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
9.7	*	1.2	*	*	*	*	*
6.7	*	1.2	*	*	*	*	*
18.2	*	1.1	*	*	*	*	48.8
22.7	*	1.1	*	*	*	*	*
9.0	*	1.1	*	*	*	*	*
10.9	12.2	1.6	*	57.1	*	34.1	9.6
7.9	17.4	1.5	*	47.8	*	45.2	18.1
14.1	8.3	1.8	*	56.2	*	24.0	9.8
23.0	33.1	1.6	*	*	*	87.7	3.8
3.7	14.6	3.1	65.8	6.1	*	11.1	26.3
*	*	1.6	*	*	*	3.0	25.6
12.3	*	1.3	*	16.9	*	19.5	20.9
11.5	75.8	1.5	90.9	29.3	*	11.5	15.4
*	*	1.0	*	*	*	*	*
11.5	*	2.0	*	9.4	25.1	5.9	13.7
*	*	1.0	*	*	*	*	*
8.0	*	2.9	81.3	7.0	24.6	4.2	11.0
*	*	1.1	*	*	90.1	63.3	42.9
*	*	1.0	*	*	*	*	*
*	*	*	*	*	*	21.0	27.0
*	*	*	*	*	*	*	*

APPENDIX TABLE III (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
Farm Managers & Foremen	1.4	*	*	*
Farm Labourers	1.0	*	*	*
Gardeners (exc. farm)	3.8	89.3	*	*
Gardeners (exc. farm)	8.0	*	*	*
Other Agricultural Occ.	1.3	45.9	*	*
<u>LOGGERS AND RELATED WORKERS</u>	*	1.3	*	*
Forest Rangers & Cruisers	*	1.3	*	*
<u>FISHERMEN, TRAPPERS AND HUNTERS</u>	*	*	1.2	*
Fishermen	*	*	1.2	*
Trappers & Hunters	*	56.2	1.1	*
<u>MINERS, QUARRYMEN AND RELATED WORKERS</u>	*	*	*	1.3
Prospectors	*	*	*	1.1
<u>CRAFTSMEN, PRODUCTION PROCESS AND RELATED WORKERS</u>	*	*	*	45.7
MILLERS, BAKERS, BREWERS AND RELATED FOOD WORKERS	*	*	*	*
Millers of Flour & Grain	*	*	*	*
Fruit & Veg. Canners	*	*	*	*

$$\frac{1}{S_{ij}}$$

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
30.8	*	*	*	54.6	*	15.6	7.7
93.5	*	*	*	88.5	*	*	59.5
78.7	*	46.1	78.7	*	*	2.6	3.8
*	*	73.0	*	*	*	2.0	3.0
42.9	*	20.0	32.1	63.7	*	25.0	29.2
6.5	*	*	*	82.0	*	*	24.1
53.2	*	*	*	*	*	*	5.9
9.2	*	*	*	82.6	*	*	*
8.7	*	*	*	78.1	*	*	*
*	*	*	*	*	*	25.8	28.4
16.4	8.2	48.5	*	*	*	*	74.1
*	*	*	*	52.9	*	13.6	59.9
2.0	6.1	15.4	64.9	8.0	*	17.1	21.3
1.3	*	*	*	5.0	*	44.6	*
1.1	*	35.0	*	10.8	*	*	*
1.0	*	*	*	38.2	*	*	*

APPENDIX TABLE III (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
TIRE BUILDERS, VULCANIZERS AND OTHER RUBBER WORKERS	*	*	*	*
Tire & Tube Builders	*	*	*	*
Vulcanizers	*	*	*	*
LEATHER CUTTERS, LASTERS, SEWERS AND OTHER LEATHER WORKERS (EXCEPT GLOVE AND GARMENT)	*	*	*	*
Leather Cutters	*	*	*	*
Shoemakers, Factory, nes	*	*	*	*
Shoemakers, Not in Factory	*	*	*	*
SPINNERS, WEAVERS, KNITTERS AND RELATED WORKERS	*	*	*	*
Weavers	*	*	*	*
TAILORS, FURRIERS, UPHOLSTERERS AND RELATED WORKERS	*	*	*	*
Dressmakers Not in Factory	*	*	*	*
Upholsterers	*	*	*	*
CARPENTERS, CABINETMAKERS, SAWYERS AND RELATED WORKERS	*	*	*	*
Carpenters	*	*	*	68.5
Sawyers	*	84.7	*	*
Inspectors, Log & Lumber	*	7.6	*	*

$$\frac{1}{S_{ij}}$$

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
1.5	*	*	*	3.1	*	*	*
1.9	*	*	*	2.2	*	*	*
5.4	*	39.8	*	1.3	*	*	*
1.2	*	*	*	*	*	7.6	*
1.0	*	*	*	*	*	*	*
1.0	*	*	*	*	*	*	*
*	*	*	*	21.8	*	1.1	*
1.0	*	*	*	61.7	*	68.5	*
1.0	*	*	*	77.5	*	29.9	*
1.3	*	*	*	14.1	*	7.8	*
13.6	*	*	*	3.7	*	1.5	*
1.2	*	39.2	*	13.0	*	29.9	*
2.5	2.5	35.6	*	21.5	*	16.1	25.3
7.4	1.7	24.3	*	23.2	*	12.1	16.7
1.1	96.2	*	*	20.1	*	*	*
1.4	*	*	*	14.4	*	20.4	*

APPENDIX TABLE III (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
PRINTERS, BOOKBINDERS AND RELATED WORKERS	*	*	*	*
Compositors & Typesetters	*	*	*	*
Photoengravers, Pressmen	*	*	*	*
Pressmen, Printing	*	*	*	*
Lithographic Occ.	*	*	*	*
Photoengravers	*	*	*	*
Bookbinders	*	*	*	*
Other Occ. in Bookbind.	*	*	*	*
Printing Workers, nes	*	*	*	*
FURNACEMEN, MOULDERS, BLACKSMITHS AND RELATED METAL WORKERS	*	*	*	51.5
Heat Treaters, Etc.	*	*	*	*
Rolling Mill Operators	*	*	*	*
Blacksmiths, Etc.	*	33.4	*	16.7
Coremakers	*	*	*	*
JEWELLERS, WATCHMAKERS AND ENGRAVERS	*	*	*	*
Engravers, Exc. Photoeng.	*	*	*	*
MACHINISTS, PLUMBERS, SHEET METAL WORKERS AND RELATED WORKERS	*	*	*	32.1
Toolmakers, Diemakers	*	*	*	*
Filers, Grinders, Etc.	*	*	*	90.1
Millwrights	*	*	*	13.7
Fitters & A., nes, Metal	*	*	*	*

$$\frac{1}{S_{ij}}$$

Manufac- turing	Construc- tion	Transportation, Storage, Communication	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
1.1	*	*	*	79.4	*	36.9	28.4
1.1	*	*	*	57.1	*	28.3	24.3
1.1	*	*	*	*	*	86.2	39.4
1.1	*	*	*	*	*	90.9	40.3
1.1	*	*	*	*	*	94.3	28.9
1.0	*	*	*	70.4	*	54.3	*
1.2	*	*	*	63.7	*	14.6	14.4
1.1	*	*	*	44.8	*	19.2	25.4
1.0	*	*	*	*	*	61.3	47.4
1.1	97.1	*	*	86.2	*	25.6	73.0
1.0	*	*	*	*	*	*	*
1.0	*	*	*	*	*	*	*
2.6	22.8	15.4	*	32.3	*	3.0	27.0
1.0	*	*	*	*	*	*	*
3.2	*	*	*	1.5	*	*	*
1.2	*	*	*	5.9	*	*	*
1.6	5.2	54.1	*	19.6	*	17.4	31.7
1.0	*	*	*	83.3	*	*	76.3
1.2	90.1	*	*	27.5	*	10.2	*
1.3	9.9	78.1	*	45.2	*	*	*
1.0	*	*	*	37.9	*	*	*

APPENDIX TABLE III (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
Plumbers & Pipefitters	*	*	*	39.2
Sheet Metal Workers	*	*	*	*
Riveters & Rivet Heaters	*	*	*	*
Boilermakers, Etc.	*	*	*	*
Welders & Flame Cutters	*	*	*	16.1
Polishers & Buffers, Metal	*	*	*	*
MECHANICS AND REPAIRMEN, ELECTRICIANS AND RELATED ELECTRICAL AND ELECTRONICS WORKERS	*	*	*	28.8
Mechanics & R., Aircraft	*	*	*	*
Mechanics & R., Motor Veh.	*	*	*	88.5
Mechanics & R., Railroad	*	*	*	*
Power Station Operators	*	*	*	31.3
Projectionists, Mot. Pic.	*	*	*	*
Linemen	*	*	*	*
Fitters, nes	*	*	*	*
Fitters	*	*	*	*
Electrical Workers, nes	*	*	*	*
PAINTERS, PAPERHANGERS AND GLAZIERS	*	*	*	*
BRICKLAYERS, PLASTERERS AND CONSTRUCTION WORKERS, NES	*	*	*	*
General Foremen, Constn.	*	*	*	*
Inspectors, Construction	*	*	*	*
Bricklayers, Etc.	*	*	*	*
Bricklayers, Etc.	*	*	*	*
Cement & Concrete Fin.	*	*	*	*
Plasterers & Lathers	*	*	*	*

$$\frac{1}{S_{ij}}$$

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
7.0	1.7	94.3	27.9	34.4	*	23.0	8.6
2.7	1.9	32.8	*	42.4	*	68.5	41.0
1.5	3.9	42.6	*	39.5	*	*	59.5
2.1	2.5	36.1	*	45.0	*	86.2	23.3
1.9	7.3	42.9	*	16.3	*	6.5	43.9
1.1	*	*	*	28.8	*	*	*
4.1	10.9	7.1	23.8	3.2	*	15.6	16.8
2.2	*	2.0	*	*	*	*	19.4
15.2	29.3	10.8	*	1.4	*	39.8	27.4
3.7	*	1.4	*	*	*	*	*
3.4	*	49.0	1.8	*	*	74.1	14.2
*	*	67.6	*	*	*	1.0	44.4
14.6	23.0	1.6	4.3	*	*	*	49.8
1.1	98.0	*	*	24.3	*	76.3	*
1.1	*	*	*	27.2	*	75.2	*
1.1	67.1	68.0	*	15.8	*	81.3	*
4.5	2.7	24.7	*	7.8	*	6.8	13.7
13.7	1.4	15.2	90.9	63.7	*	42.2	10.6
29.9	1.4	6.6	58.5	*	*	98.0	11.7
26.3	28.8	4.3	20.4	*	28.9	6.7	2.2
13.9	1.2	*	*	*	*	*	16.1
14.1	1.2	*	*	89.3	*	80.0	26.5
13.6	*	*	*	*	*	*	7.2
*	1.0	*	*	*	*	55.9	*

APPENDIX TABLE III (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
CLAY, GLASS AND STONE WORKERS	*	*	*	49.8
Lens Grinders, Etc.	*	*	*	*
Furnacemen, Etc., C. & G.	*	*	*	*
Stone Cutters & Dressers	*	*	*	4.1
STATIONARY ENGINE AND EXCAVATING AND LIFTING EQUIPMENT OPERATORS AND RELATED WORKERS	*	32.3	*	14.6
Boiler Firemen (exc. ship)	*	*	*	27.0
Stationary Enginemen	*	*	*	28.1
Motormen (veh.) Exc. Rail	*	*	*	1.1
Hoistmen, Etc., nes	*	34.4	*	14.9
Hoistmen, Etc.	*	24.3	*	8.3
Operators, nes	*	42.6	*	23.5
LONGSHOREMEN AND STEVEDORES	*	64.9	*	*
SECTIONMEN AND TRACKMEN	*	*	*	28.1
OTHER PRODUCTION PROCESS AND RELATED WORKERS	*	*	*	*
Tobacco Preparers, Etc.	*	*	*	*
Patternmakers (exc. paper)	*	*	*	*
Paper Products Makers	*	*	*	*
Photographic Proc. Occ.	*	*	*	*
Inspectors, Etc., nes, M.	*	*	*	*
Inspectors, Etc., nes	5.3	*	*	*

$$\frac{1}{S_{ij}}$$

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
1.2	46.1	*	*	10.9	*	74.1	*
1.7	*	*	*	3.0	*	14.6	*
1.1	14.6	*	*	65.4	*	*	*
1.7	11.8	*	*	20.3	*	62.5	69.0
3.6	3.7	8.9	69.4	29.8	*	14.1	8.7
3.3	30.2	21.6	37.3	45.2	74.6	4.1	3.7
2.7	64.1	31.3	35.2	38.2	41.8	3.9	4.9
19.5	75.8	80.0	*	64.9	*	*	84.0
5.0	2.2	7.6	*	35.7	*	*	12.6
2.0	6.7	8.3	*	20.9	*	*	53.8
15.9	1.7	7.4	90.1	53.8	*	*	9.3
7.0	*	1.3	*	30.1	*	85.5	*
43.1	*	1.1	*	*	*	*	*
1.3	*	51.5	69.0	10.5	*	30.0	22.2
1.0	*	*	*	42.7	*	*	*
1.1	*	37.3	*	87.0	*	89.3	*
1.0	*	*	*	55.6	*	*	*
3.8	*	84.7	*	27.7	*	1.6	22.2
1.2	*	19.3	*	58.8	*	70.4	16.2
6.1	*	15.7	*	6.6	*	78.7	2.5

APPENDIX TABLE III (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
<u>LABOURERS (INCL. WAREHOUSEMEN AND FREIGHT HANDLERS, N.E.S.)</u>	*	60.2	*	84.0
Labourers	*	64.5	*	84.7
Warehousemen, n.e.s.	*	37.0	*	75.8

Note: a) S_{ij} is the proportion that employment in occupation i and industry j forms of employment in occupation i , i.e. $S_{ij} = x_{ij}y_j/E_i = E_{ij}/E_i$
 $\therefore 1/S_{ij} = E_i/E_{ij}$.

b) An * indicates that employment in occupation i and industry j , $E_{ij} = 0$.

c) When in any row, $1/S_{ij} = 1.0$ for $j = k$ and $1/S_{ij} \neq 0$ for $j \neq k$, this is due to rounding, to 1 decimal place, $1/S_{ik}$ to 1.0.

$$\frac{1}{S_{ij}}$$

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Adminis- tration
4.4	4.4	9.9	46.7	4.2	*	16.2	11.2
4.4	4.0	11.8	43.9	4.7	*	15.0	10.4
5.2	40.0	3.9	*	2.3	*	67.6	45.5

ESTIMATED NUMBER OF SURVIVORS OF
BY OCCUPATION

	ATLANTIC	QUEBEC
<u>MANAGERIAL OCCUPATIONS</u>	32.0	105.2
<u>PROFESSIONAL AND TECHNICAL OCCUPATIONS</u>	39.7	144.5
PROFESSIONAL ENGINEERS	2.2	10.4
Civil (inc. surveyors)	1.2	3.7
Mechanical	0.4	2.6
Mechanical	0.3	1.8
Industrial	0.1	0.8
Electrical	0.4	2.1
Chemical	0.0	0.6
BIOLOGISTS AND AGRICULTURAL PROFESSIONALS	0.3	1.0
Veterinarians	0.1	0.2
TEACHERS	16.1	49.9
Professors	0.6	4.1
School Teachers	14.9	41.9
HEALTH PROFESSIONALS	9.9	27.3
Physicians & Surgeons	1.1	4.7
Dentists	0.3	1.0
Nurses, Graduate	4.9	10.9
Nurses-in-Training	2.2	5.6
Osteopaths	0.0	0.2
Medical & D. Technicians	0.9	2.9

THE 1961 LABOUR FORCE IN 1975
CLASS BY REGION

Thousands

ONTARIO	PRAIRIES	BRITISH COLUMBIA	CANADA
153.4	66.5	41.9	399.0
182.8	81.6	43.8	492.3
16.5	5.2	3.2	37.4
5.3	2.8	1.8	14.8
4.6	0.7	0.5	8.8
2.9	0.5	0.4	5.9
1.7	0.2	0.1	2.9
3.0	0.5	0.4	6.4
1.1	0.2	0.2	2.2
1.4	1.1	0.4	4.3
0.5	0.3	0.1	1.1
47.6	28.2	12.3	154.0
2.3	1.0	0.6	8.5
43.5	26.0	11.2	137.6
42.4	21.2	12.0	112.8
5.9	2.5	1.6	15.7
1.7	0.6	0.5	4.0
20.7	9.9	6.0	52.3
6.4	3.8	1.7	19.7
0.4	0.1	0.1	0.8
3.9	2.4	1.1	11.1

APPENDIX TABLE IV (Cont'd)

	ATLANTIC	QUEBEC
LAW PROFESSIONALS	0.5	2.6
Judges & Magistrates	0.1	0.1
Lawyers & Notaries	0.5	2.5
RELIGION PROFESSIONALS	2.7	11.0
Clergymen, n.o.r.	1.6	4.0
Nuns & Brothers, n.o.r.	0.8	5.3
ARTISTS, WRITERS AND MUSICIANS	1.3	7.2
Artists & Art Teachers	0.2	1.7
Commercial	0.1	1.1
Except Commercial	0.1	0.7
Authors	0.5	2.9
Musicians	0.6	2.6
OTHER PROFESSIONALS	6.6	35.1
Architects	0.1	0.7
Draughtsmen	0.6	3.8
Actuaries	0.1	0.7
Librarians	0.2	0.6
Interior Decorators	0.2	0.8
Photographers	0.1	0.8
<u>CLERICAL OCCUPATIONS</u>	43.5	180.2
Office Appliance Oper.	0.7	4.9
Shipping & R. Clerks	2.3	11.6
Baggagemen, Transport	0.1	0.4

Thousands

ONTARIO	PRAIRIES	BRITISH COLUMBIA	CANADA
3.8	1.6	1.0	9.4
0.2	0.1	0.1	0.6
3.5	1.4	0.9	8.8
7.0	3.8	1.3	25.8
4.5	2.2	1.0	13.3
1.6	0.6	0.1	8.3
10.6	3.3	2.2	24.6
2.7	0.6	0.5	5.6
2.0	0.4	0.3	3.9
0.7	0.1	0.2	1.8
4.3	1.2	0.9	9.9
3.6	1.5	0.8	9.1
53.5	17.3	11.4	123.9
0.8	0.3	0.2	2.2
7.2	2.1	1.3	15.1
1.2	0.2	0.1	2.2
1.4	0.4	0.3	2.9
1.4	0.4	0.3	3.1
1.1	0.4	0.3	2.7
285.3	103.2	59.5	671.7
11.3	4.4	2.2	23.5
19.0	5.4	3.1	41.4
0.4	0.4	0.1	1.3

APPENDIX TABLE IV (Cont'd)

	ATLANTIC	QUEBEC
Ticket Agents, Transport	0.7	1.4
Stenographers	12.0	46.9
Stenographers	9.8	37.6
Typists	2.2	9.2
Attendants, D. & D. Off.	0.1	0.4
<u>SALES OCCUPATIONS</u>	27.0	82.5
Foremen, Trade	0.4	1.9
Auctioneers	0.0	0.0
Canvassers	0.9	2.9
Sales Clerks	20.8	49.3
Sales Clerks	19.4	46.7
Service Station Attendants	1.4	2.7
Advertising Salesmen	0.1	0.6
Insurance Salesmen	1.2	0.8
Real Estate Salesmen	0.1	1.3
Security Salesmen	0.2	1.0
Brokers, n.e.s.	0.2	0.9
<u>SERVICE AND RECREATION OCCUPATIONS</u>	47.4	149.3
PROTECTIVE SERVICE OCCUPATIONS	5.3	18.2
Firemen, Fire Protection	1.2	2.5
Policemen & Detectives	1.9	7.0
Guards, Watchmen, n.e.s.	2.2	8.7

Thousands

ONTARIO	PRAIRIES	BRITISH COLUMBIA	CANADA
2.1	1.5	0.8	6.4
79.4	29.1	17.0	184.3
57.5	22.5	13.6	141.0
21.9	6.6	3.3	43.3
1.5	0.6	0.6	3.2
121.9	53.9	32.4	317.7
3.8	1.3	0.5	7.9
0.1	0.1	0.0	0.3
4.1	2.1	1.2	11.3
72.7	35.4	20.7	198.9
66.7	32.5	19.0	184.3
6.0	2.9	1.7	14.6
1.1	0.3	0.2	2.4
8.5	2.9	1.8	15.2
3.9	1.4	1.6	8.3
1.8	0.5	0.5	3.9
1.8	0.9	0.5	4.4
202.2	92.9	52.5	544.4
21.3	7.8	5.4	57.9
3.8	1.8	1.1	10.4
7.7	3.4	1.9	21.9
9.8	2.6	2.4	25.6

APPENDIX TABLE IV (Cont'd)

	ATLANTIC	QUEBEC
HOUSEKEEPERS, WAITERS, COOKS AND RELATED WORKERS	31.1	89.2
Housekeepers	1.2	3.4
Cooks	3.3	12.2
Waiters	4.5	20.4
Waiters & Waitresses	4.3	18.4
Bartenders	0.3	2.0
Nursing Assistants & Aides	4.5	12.0
Porters, Baggage & Pullman	0.4	1.0
Baby Sitters, n.e.s.	15.5	37.2
Baby Sitters	0.5	1.5
Maids, n.e.s.	15.0	35.6
ATHLETES, ENTERTAINERS AND RELATED WORKERS	0.3	1.4
Actors	0.1	0.8
Athletes & Sports Offils.	0.2	0.7
OTHER SERVICE OCCUPATIONS	10.7	40.5
Barbers, Hairdrs., Manic.	2.5	9.8
Launderers & Dry Cleaners	2.1	6.9
Elevator Tenders, Bldg.	0.2	1.5
Janitors & Cleaners, Bldg.	5.1	19.2
Funeral Dir. & Embalmers	0.2	0.5
Guides	0.2	0.6
<u>TRANSPORT AND COMMUNICATION OCCUPATIONS</u>	29.3	87.0
AIR PILOTS, NAVIGATORS AND FLIGHT ENGINEERS	0.1	0.6

Thousands

ONTARIO	PRAIRIES	BRITISH COLUMBIA	CANADA
117.0	57.8	32.6	327.7
4.7	2.4	1.6	13.4
11.8	7.3	4.7	39.4
26.3	13.2	7.7	72.1
24.2	11.6	6.7	65.2
2.1	1.6	0.9	6.9
19.7	9.9	5.6	51.7
1.3	0.7	0.3	3.8
41.6	20.6	10.8	125.7
4.4	2.9	1.3	10.7
37.2	17.7	9.5	115.0
2.1	0.6	0.6	5.0
0.8	0.2	0.2	2.2
1.3	0.4	0.3	2.8
61.8	26.7	14.0	153.8
13.4	5.2	2.8	33.7
9.8	4.6	2.4	25.9
1.5	0.5	0.4	4.0
31.5	14.5	7.2	77.5
0.8	0.3	0.2	2.0
1.1	0.2	0.1	2.2
100.2	46.4	27.5	290.3
0.5	0.4	0.4	2.0

APPENDIX TABLE IV (Cont'd)

	ATLANTIC	QUEBEC
OPERATORS, RAILROAD	2.3	3.9
Locomotive Engineers	0.7	1.0
Locomotive Firemen	0.3	0.4
Conductors, Railroad	0.4	0.8
Brakemen, Switch. & Sig.	1.0	1.7
OPERATORS, WATER TRANSPORT	3.4	3.3
Deck & Engrg. Off., Ship	1.5	1.5
Deck Ratings (ship)	1.6	1.5
Engine-room Ratings, Ship	0.4	0.3
OPERATORS, ROAD TRANSPORT	16.5	60.0
Bus Drivers	1.2	4.3
Taxi Drivers & CHAUFFEURS	1.7	7.5
OTHER TRANSPORT OCCUPATIONS	0.7	0.7
Operators, E. S. Railway	0.0	0.0
OTHER COMMUNICATION OCCUPATIONS	5.1	14.4
Radio & T.V. Announcers	0.1	0.3
Telephone Operators	2.5	8.0
Telegraph Operators	0.5	0.8
Postmen & Mail Carriers	1.0	2.6
<u>FARMERS AND FARM WORKERS</u>	25.9	101.2
Farmers & Stockraisers	15.0	56.5

Thousands

ONTARIO	PRAIRIES	BRITISH COLUMBIA	CANADA
7.6	4.9	1.8	20.5
2.1	1.3	0.5	5.5
1.1	0.6	0.3	2.7
1.7	0.9	0.4	4.2
2.8	2.0	0.7	8.1
2.8	0.3	2.9	12.7
1.1	0.1	1.7	5.9
1.2	0.2	1.1	5.5
0.4	0.0	0.1	1.3
63.7	28.7	15.9	184.7
3.6	3.2	1.4	13.6
4.5	1.5	1.0	16.2
1.5	0.2	0.2	3.2
0.9	0.0	0.0	1.0
18.7	9.2	4.7	52.1
0.4	0.3	0.1	1.2
11.2	5.9	2.6	30.1
1.0	0.6	0.3	3.2
3.8	1.4	1.0	9.8
126.8	207.8	18.0	479.5
69.5	135.7	8.5	285.2

APPENDIX TABLE IV (Cont'd)

	ATLANTIC	QUEBEC
Farm Managers, Foremen	0.2	0.3
Farm Labourers	9.1	39.7
Gardeners (exc. farm)	1.5	4.6
Gardeners (exc. Farm)	1.3	4.1
Other Agricultural Occ.	0.2	0.5
<u>LOGGERS AND RELATED WORKERS</u>	13.7	23.9
Forest Rangers & Cruisers	0.6	1.8
<u>FISHERMEN, TRAPPERS AND HUNTERS</u>	15.7	2.1
Fishermen	15.7	1.8
Trappers & Hunters	0.0	0.3
<u>MINERS, QUARRYMEN AND RELATED WORKERS</u>	7.7	9.6
Prospectors	0.0	0.1
<u>CRAFTSMEN, PRODUCTION PROCESS AND RELATED WORKERS</u>	84.6	368.6
MILLERS, BAKERS, BREWERS AND RELATED FOOD WORKERS	9.1	16.9
Millers of Flour & Grain	0.0	0.6
Fruit and Veg. Canners	0.1	0.4

Thousands

ONTARIO	PRAIRIES	BRITISH COLUMBIA	CANADA
0.9	0.6	0.3	2.4
47.6	67.0	6.5	170.0
8.7	4.4	2.6	21.8
7.3	3.1	2.3	18.0
1.4	1.3	0.3	3.8
8.4	3.0	9.1	58.0
1.1	1.4	0.7	5.5
1.3	2.3	3.6	25.0
1.1	1.1	3.5	23.2
0.3	1.1	0.0	1.8
18.5	7.3	3.5	46.6
0.2	0.1	0.1	0.6
449.9	138.3	98.2	1,139.6
19.0	7.7	4.9	57.6
0.7	0.3	0.0	1.6
1.7	0.1	0.5	2.8

APPENDIX TABLE IV (Cont'd)

	ATLANTIC	QUEBEC
TIRE BUILDERS, VULCANIZERS AND OTHER RUBBER WORKERS	0.1	2.5
Tire & Tube Builders	0.0	0.1
Vulcanizers	0.1	0.3
LEATHER CUTTERS, LASTERS, SEWERS AND OTHER LEATHER WORKERS (EXCEPT GLOVE AND GARMENT)	0.5	10.0
Leather Cutters	0.0	1.2
Shoemakers, Factory n.e.s.	0.2	6.0
Shoemakers Not in Factory	0.2	1.3
SPINNERS, WEAVERS, KNITTERS AND RELATED WORKERS	0.8	16.5
Weavers	0.1	2.4
TAILORS, FURRIERS, UPHOLSTERERS AND RELATED WORKERS	2.2	49.3
Dressmakers Not in Factory	0.9	5.2
Upholsterers	0.1	1.3
CARPENTERS, CABINETMAKERS, SAWYERS AND RELATED WORKERS	14.3	39.3
Carpenters	11.7	28.5
Sawyers	1.3	2.2
Inspectors, Log & Lumber	0.3	1.6

Thousands

ONTARIO	PRAIRIES	BRITISH COLUMBIA	CANADA
4.7	0.5	0.3	8.0
1.8	0.1	0.0	2.0
0.7	0.4	0.2	1.8
7.0	0.8	0.4	18.7
0.8	0.0	0.0	2.0
4.1	0.1	0.0	10.3
1.1	0.6	0.3	3.6
9.1	0.2	0.3	26.8
0.9	0.0	0.0	3.5
25.8	8.6	3.1	89.0
4.2	1.9	1.0	13.3
1.9	0.5	0.3	4.2
36.4	16.4	19.5	126.0
26.3	14.2	8.3	88.9
1.8	0.5	3.9	9.7
0.7	0.1	2.0	4.8

APPENDIX TABLE IV (Cont'd)

	ATLANTIC	QUEBEC
PRINTERS, BOOKBINDERS AND RELATED WORKERS	1.1	8.7
Compositors & Typesetters	0.7	3.5
Photoengravers, Pressmen	0.3	3.1
Pressmen, Printing	0.2	2.2
Lithographic Occ.	0.0	0.6
Photoengravers	0.0	0.3
Bookbinders	0.1	1.2
Other Occ. in Bookbinding	0.1	0.3
Printing Workers, n.e.s.	0.1	0.6
FURNACEMEN, MOULDERS, BLACKSMITHS AND RELATED METAL WORKERS	1.3	6.8
Heat Treaters, Etc.	0.0	0.2
Rolling Mill Operators	0.1	0.2
Blacksmiths, Etc.	0.4	1.2
Coremakers	0.0	0.1
JEWELLERS, WATCHMAKERS AND ENGRAVERS	0.2	1.7
Engravers, Exc. Photoeng.	0.0	0.3
MACHINISTS, PLUMBERS, SHEET METAL WORKERS AND RELATED WORKERS	8.8	45.3
Toolmakers, Diemakers	0.1	1.4
Filers, Grinders, Etc.	0.1	0.7
Millwrights	1.9	1.4
Fitters & A. n.e.s., Metal	0.4	2.3

Thousands

ONTARIO	PRAIRIES	BRITISH COLUMBIA	CANADA
13.8	2.9	1.8	28.5
5.4	1.5	0.9	12.0
4.9	0.8	0.6	9.6
3.1	0.6	0.4	6.5
1.3	0.1	0.2	2.2
0.5	0.0	0.0	0.9
1.4	0.3	0.2	3.2
0.9	0.2	0.1	1.6
1.2	0.1	0.1	2.1
11.6	1.8	1.9	23.3
0.6	0.0	0.0	0.8
1.1	0.1	0.0	1.6
1.3	0.6	0.2	3.7
0.5	0.0	0.0	0.7
1.7	0.5	0.3	4.4
0.3	0.0	0.1	0.7
84.0	14.7	11.8	164.6
6.0	0.1	0.1	7.7
2.8	0.2	0.5	4.3
3.3	0.4	1.4	8.4
9.7	0.3	0.3	13.0

APPENDIX TABLE IV (Cont'd)

	ATLANTIC	QUEBEC
Plumbers & Pipefitters	2.3	9.3
Sheet Metal Workers	0.7	3.6
Riveters & Rivet Heaters	0.1	0.6
Boilermakers, Etc.	0.9	1.9
Welders & Flame Cutters	1.6	8.1
Polishers & Buffers, Metal	0.0	0.6
MECHANICS AND REPAIRMEN, ELECTRICIANS AND RELATED ELECTRICAL AND ELECTRONICS WORKERS	16.6	61.6
Mechanics & R., Aircraft	0.3	2.3
Mechanics & R., Motor Veh.	5.7	18.9
Mechanics & R., Railroad	0.5	1.5
Power Station Operators	0.4	1.1
Projectionists, Mot. Pic.	0.1	0.3
Linemen	2.2	5.2
Fitters, n.e.s.	0.2	4.1
Fitters	0.1	3.4
Electrical Workers, n.e.s.	0.0	0.6
PAINTERS, PAPERHANGERS AND GLAZIERS	3.4	11.3
BRICKLAYERS, PLASTERERS AND CONSTRUCTION WORKERS, N.E.S.	3.8	16.3
General Foremen, Constn.	1.5	3.5
Inspectors, Construction	0.2	0.7
Bricklayers, Etc.	1.2	5.9
Bricklayers, Etc.	1.0	4.7
Cement and Concrete Fini.	0.2	1.3
Plasterers & Lathers	0.2	2.0

Thousands

ONTARIO	PRAIRIES	BRITISH COLUMBIA	CANADA
9.6	4.0	2.3	27.4
5.3	2.0	1.0	12.5
0.3	0.1	0.0	1.0
1.9	0.6	0.9	6.2
12.5	3.8	2.3	28.3
1.4	0.0	0.1	2.1
84.5	31.7	18.6	213.0
0.8	1.0	0.6	5.0
22.9	12.0	5.3	64.8
1.4	1.4	0.3	5.2
1.2	0.5	0.3	3.6
0.3	0.2	0.1	1.0
7.5	3.5	2.2	20.6
9.9	0.4	0.3	14.8
7.9	0.3	0.2	12.1
2.0	0.0	0.0	2.7
14.9	5.0	2.8	37.4
21.6	8.6	4.4	54.7
4.4	2.8	1.2	13.3
1.1	0.5	0.3	2.8
9.1	2.5	1.0	19.7
7.2	1.6	0.7	15.2
1.9	0.9	0.4	4.6
3.0	1.3	0.7	7.3

APPENDIX TABLE IV (Cont'd)

	ATLANTIC	QUEBEC
CLAY, GLASS AND STONE WORKERS	0.4	3.2
Lens Grinders, Etc.	0.1	0.3
Furnacemen, Etc., C. & G.	0.0	0.2
Stone Cutters & Dressers	0.1	0.6
STATIONARY ENGINE AND EXCAVATING AND LIFTING EQUIPMENT OPERATORS AND RELATED WORKERS	8.9	18.6
Boiler Firemen (exc. ship)	0.9	2.1
Stationary Enginemen	1.9	4.6
Motormen (veh.), Exc. Rail	0.2	0.2
Hoistmen, Etc., n.e.s.	3.9	7.3
Hoistmen, Etc.	1.0	2.1
Operators, n.e.s.	2.8	5.2
LONGSHOREMEN AND STEVEDORES	2.8	3.4
SECTIONMEN AND TRACKMEN	1.9	2.5
OTHER PRODUCTION PROCESS AND RELATED OCCUPATIONS	8.5	54.7
Tobacco Preparers, Etc.	0.0	2.7
Patternmakers (exc. paper)	0.1	0.4
Paper Products Makers	0.2	2.6
Photographic Proc. Occ.	0.1	0.5
Inspectors, Etc., n.e.s., M.	0.2	2.7
Inspectors, Etc., n.e.s.	0.4	0.6

Thousands

ONTARIO	PRAIRIES	BRITISH COLUMBIA	CANADA
4.3	1.0	0.4	9.3
0.6	0.2	0.1	1.3
0.5	0.1	0.0	0.9
0.4	0.1	0.0	1.3
29.6	17.8	12.3	87.2
1.0	0.5	0.4	4.9
9.5	2.9	2.4	21.3
0.9	0.3	0.1	1.7
12.7	5.6	4.4	33.8
5.1	0.9	1.7	10.9
7.6	4.7	2.6	22.9
1.0	0.1	1.9	9.0
4.6	5.8	2.0	16.8
76.4	14.2	11.5	165.3
0.6	0.0	0.0	3.4
0.9	0.0	0.1	1.4
4.1	0.5	0.4	7.8
1.1	0.4	0.2	2.4
7.3	0.4	0.3	10.9
1.2	0.8	0.4	3.4

APPENDIX TABLE IV (Cont'd)

	ATLANTIC	QUEBEC
<u>LABOURERS (INCL. WAREHOUSEMEN AND FREIGHT HANDLERS, N.E.S.)</u>	28.2	76.4
Labourers	24.9	70.4
Warehousemen, n.e.s.	3.4	6.0
<u>OCCUPATIONS NOT STATED</u>	10.3	41.8
<u>ALL OCCUPATIONS</u>	406.2	1,376.5

Source: Calculated from data available in Census of Canada, Volume III - Part 1, Bulletins 3, 1-9 to 3, 1-12, and Bulletin SL-1, Cat. No. 94-551. Data on the armed forces, obtained separately from D.B.S., were deleted from Service and Recreation Occupations.

Thousands

ONTARIO	PRAIRIES	BRITISH COLUMBIA	CANADA
88.9	36.4	23.9	253.8
82.7	32.9	20.8	231.7
6.2	3.5	3.1	22.1
40.7	20.6	13.0	126.3
1,785.5	863.0	428.2	4,859.4

PROJECTED DISTRIBUTION OF EMPLOYMENT BY OCCUPATION

	Agricul- ture	Forestry	Fishing and Trapping	Mining, Quarry- ing, Oilwells
<u>MANAGERIAL OCCUPATIONS</u>	1.382	3.134	1.881	4.513
<u>PROFESSIONAL AND TECHNICAL OCCUPATIONS</u>	.590	5.172	2.739	13.952
PROFESSIONAL ENGINEERS	.005	.901	.067	3.587
Civil (incl. surveyors)	.004	.833	.058	1.057
Mechanical	-	.016	.006	.611
Mechanical	-	.003	.006	.362
Industrial	-	.013	-	.249
Electrical	-	.002	-	.075
Chemical	-	-	.003	.183
BIOLOGISTS AND AGRICULTURAL PROFESSIONALS	.449	.292	.601	.005
Veterinarians	.284	.001	-	-
TEACHERS	.007	.011	.003	.020
Professors	-	-	-	-
School Teachers	.004	.005	-	.014
HEALTH PROFESSIONALS	.005	.018	.009	.087
Physicians & Surgeons	-	.004	-	.025
Dentists	-	-	-	.001
Nurses, Graduate	-	.011	-	.056
Nurses-in-Training	-	-	-	-
Osteopaths	-	-	-	-
Medical & D. Technicians	.004	-	.006	.004

TABLE V

CLASS FOR EACH INDUSTRY DIVISION, CANADA, 1975

Percentages							
Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
7.465	10.781	6.527	6.564	18.040	20.306	4.795	7.453
7.747	1.688	6.127	9.907	1.822	2.212	37.427	18.272
1.833	.569	1.341	3.811	.259	.155	1.146	2.236
.157	.382	.885	1.481	.025	.056	.659	1.691
.808	.078	.109	.413	.059	.071	.191	.125
.524	.061	.086	.281	.043	.020	.134	.101
.284	.017	.023	.132	.016	.051	.057	.024
.373	.045	.311	1.794	.052	.005	.091	.138
.202	.004	.005	.030	.015	.001	.015	.060
.034	.001	.020	.057	.013	.004	.141	1.134
.001	-	-	-	-	-	.004	.095
.013	.001	.036	.057	.020	.020	15.575	.775
-	-	-	-	-	-	1.145	-
.004	-	.008	.006	.005	.006	13.696	.321
.432	.009	.027	.076	.538	.077	11.087	1.328
.008	.001	.007	.014	.002	.031	1.606	.268
.001	-	-	-	-	-	.347	.034
.063	.006	.015	.050	.026	.036	5.110	.775
-	-	-	-	-	-	1.886	-
-	-	-	-	-	-	.103	-
.345	.001	.002	.009	.006	.004	1.659	.181

APPENDIX TABLE V (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
LAW PROFESSIONALS	-	.002	-	.087
Judges & Magistrates	-	-	-	-
Lawyers and Notaries	-	.002	-	.087
RELIGION PROFESSIONALS	.005	-	.003	-
Clergymen, n.o.r.	.004	-	-	-
Nuns & Brothers, n.o.r.	-	-	.003	-
ARTISTS, WRITERS AND MUSICIANS	.002	.006	.006	.025
Artists & Art Teachers	-	.001	-	.003
Commercial	-	.001	-	.003
Except Commercial	-	-	-	-
Authors	.002	.006	.006	.023
Musicians	-	-	-	-
OTHER PROFESSIONALS	.117	3.942	2.049	10.141
Architects	-	.001	-	.004
Draughtsmen	.002	.117	.014	.584
Actuaries	.001	.006	.009	.020
Librarians	-	.001	.003	.010
Interior Decorators	.006	-	-	-
Photographers	-	.011	-	.006
<u>CLERICAL OCCUPATIONS</u>	.376	3.973	1.050	11.198
Office Appliance Oper.	.001	.044	.012	.290
Shipping & R. Clerks	.025	.049	.009	.219
Baggagemen, Transport	-	-	-	-

Percentages

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
.017	.004	.022	.058	.006	.094	.732	.320
-	-	-	-	-	-	.001	.139
.017	.004	.022	.058	.006	.094	.731	.181
.001	-	-	-	.004	-	2.199	.052
.001	-	-	-	.003	-	1.279	.022
-	-	-	-	.001	-	.682	.001
.746	.012	.891	.272	.142	.106	1.331	.360
.220	.004	.069	.031	.068	.010	.317	.109
.202	.004	.054	.028	.064	.010	.121	.061
.018	-	.015	.003	.004	.001	.196	.048
.524	.008	.724	.241	.067	.095	.340	.221
.001	-	.098	-	.006	-	.675	.030
4.671	1.092	3.789	5.575	.840	1.755	5.216	12.066
.004	.013	.019	.018	.003	.030	.345	.076
.571	.207	.241	1.555	.062	.055	.359	1.091
.172	.002	.188	.298	.050	.346	.036	.187
.014	-	.054	.024	.003	.013	.249	.108
.014	.011	.009	.010	.395	.003	.062	.006
.061	.001	.023	.033	.006	.007	.170	.073
12.487	4.112	19,980	22,257	18.038	53.674	11.766	24.888
1.673	.046	1.330	2.388	1.049	8.281	.434	2.101
2.307	.078	.820	.198	1.619	.046	.064	.094
-	-	.295	-	-	-	-	-

APPENDIX TABLE V (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
Ticket Agents, Transport	-	-	-	-
Stenographers	.105	.924	.234	4.272
Stenographers	.085	.739	.211	3.732
Typists	.020	.185	.023	.540
Attendants, D. & D. Off.	.001	-	-	-
<u>SALES OCCUPATIONS</u>	.287	.398	.152	.646
Foremen, Trade	.001	-	.003	.003
Auctioneers	-	-	-	-
Canvassers	.018	.001	-	.001
Sales Clerks	.157	.193	.035	.085
Sales Clerks	.157	.175	.032	.081
Service Station Att.	-	.018	.003	.004
Advertising Salesmen	-	-	-	-
Insurance Salesmen	-	-	.003	.001
Real Estate Salesmen	-	.019	-	.006
Security Salesmen	-	-	-	.010
Brokers, nes	.001	.036	.014	.417
<u>SERVICE AND RECREATION OCCUPATIONS</u>	.190	4.344	3.294	2.572
<u>PROTECTION SERVICE OCCUPATIONS</u>	.023	1.043	2.601	.748
Firemen, Fire Protection	.002	.327	.003	.017
Policemen & Detectives	.001	.116	2.419	.085
Guards, Watchmen, nes	.020	.600	.179	.646

Percentages

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
-	-	1.451	-	-	-	-	-
3.489	1.457	3.825	4.997	2.806	16.125	5.465	7.637
2.626	1.261	2.675	3.827	2.116	11.754	4.696	5.230
.863	.196	1.150	1.169	.691	4.370	.769	2.407
.002	-	-	-	.001	.002	.259	.096
5.471	.632	1.547	1.870	27.514	15.718	.975	.449
.103	.003	.010	.065	1.049	.017	.010	.002
-	-	.002	-	.020	-	-	.001
.394	.025	.054	.262	.605	.031	.075	.002
1.175	.306	.227	.460	22.780	.074	.515	.150
1.151	.293	.162	.429	18.675	.069	.506	.115
.024	.013	.065	.030	4.105	.005	.009	.035
.234	.003	.341	.011	.016	.012	.054	.001
.002	.001	.004	.004	.005	8.171	.125	.048
.002	.044	.009	.040	.003	5.243	.005	.020
.001	.002	.001	.001	.005	1.506	.004	.003
.056	.022	.387	.428	.094	.558	.097	.213
2.050	1.667	3.841	2.265	2.871	5.559	36.540	19,431
.601	.592	.478	.379	.204	.107	1.035	13.470
.067	.008	.028	.033	.004	.016	.007	3.675
.024	.003	.129	.074	.021	.014	.176	7.322
.509	.581	.321	.272	.179	.077	.852	2.472

APPENDIX TABLE V (Cont'd)

	Agricul- ture	Forestry	Fishing and Trapping	Mining, Quarry- ing, Oilwells
HOUSEKEEPERS, WAITERS, COOKS AND RELATED WORKERS	.101	3.067	.539	.743
Housekeepers	.002	.012	.014	.028
Cooks	.029	1.376	.484	.309
Waiters	.003	.001	.023	.068
Waiters & Waitresses	.003	-	.023	.067
Bartenders	-	.001	-	.001
Nursing Assistants & Aides	.002	.067	-	.130
Porters, Baggage & Pullman	-	.001	-	-
Baby Sitters, nes	.064	1.610	.017	.207
Baby Sitters	-	-	-	-
Maids, nes	.064	1.610	.017	.207
ATHLETES, ENTERTAINERS AND RELATED WORKERS	.010	-	.003	.004
Actors	.007	-	-	-
Athletes & Sports Offils.	.004	-	.003	.004
OTHER SERVICE OCCUPATIONS	.055	.234	.150	1.076
Barbers, Hairdres., Manic.	-	.001	-	.001
Launderers & Dry Cleaners	-	.014	.006	.012
Elevator Tenders, Bldg.	-	-	-	.039
Janitors & Cleaners, Bldg.	.020	.169	.052	1.013
Funeral Dir. & Embalmers	-	-	-	-
Guides	-	.040	.090	.005
<u>TRANSPORT AND COMMUNICATION OCCUPATIONS</u>	.480	5.344	1.678	4,366
AIR PILOTS, NAVIGATORS AND FLIGHT ENGINEERS	.002	.052	.003	.069

Percentages

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance Real Estate	Service	Public Admini- stration
.387	.261	1.745	.374	1.038	.578	23.214	1.808
.029	.005	.427	.014	.042	.035	1.040	.103
.105	.158	.380	.133	.164	.058	3.117	.464
.106	.013	.307	.093	.640	.286	5.105	.608
.103	.013	.299	.093	.637	.282	4.460	.567
.003	-	.008	-	.003	.004	.644	.041
.059	.019	.020	.017	.004	.006	7.724	.269
.002	.001	.426	-	.004	.022	.118	.006
.086	.065	.184	.117	.185	.170	3.848	.357
-	-	-	-	-	-	.342	.004
.086	.065	.184	.117	.185	.170	3.506	.353
.001	.001	.121	.004	.001	.002	.660	.086
-	-	.119	-	.001	.001	.259	.002
.001	.001	.002	.004	.001	.001	.402	.085
1.061	.813	1.498	1.508	1.628	4.872	11.630	4.068
.003	.002	.011	.011	.108	-	1.691	.016
.010	.002	.011	.011	.016	.003	2.720	.079
.057	.014	.044	.048	.073	.216	.142	.139
.963	.793	1.392	1.392	1.410	4.627	6.235	3.650
-	-	-	-	.001	-	.170	-
.003	-	.012	.030	.002	.001	.170	.032
5.925	4.945	33.665	8.139	5.507	1.039	1.979	4.047
.007	.007	1.111	.017	.004	-	.005	.013

APPENDIX TABLE V (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
OPERATORS, RAILROAD	-	.055	.009	.178
Locomotive Engineers	-	.026	.009	.101
Locomotive Firemen	-	.006	-	.016
Conductors, Railroad	-	.004	-	.033
Brakemen, Switch. & Sig.	-	.020	-	.028
OPERATORS, WATER TRANSPORT	.001	.653	1.477	.058
Deck & Engrg. Off., Ship	-	.147	.865	.028
Deck Ratings (ship)	.001	.497	.600	.025
Engine-room Ratings, Ship	-	.009	.012	.006
OPERATORS, ROAD TRANSPORT	.474	4.139	.179	3.828
Bus Drivers	-	.015	-	.015
Taxi Drivers & Chauffeurs	.001	.006	-	.024
OTHER TRANSPORT OCCUPATIONS	.001	.398	.003	.112
Operators, E. S. Railway	-	-	-	-
OTHER COMMUNICATION OCCUPATIONS	.002	.046	.006	.121
Radio & TV Announcers	-	.001	-	-
Telephone Operators	.001	.031	.003	.097
Telegraph Operators	-	-	-	.001
Postmen & Mail Carriers	-	-	-	-
<u>FARMERS AND FARM WORKERS</u>	95.514	.934	.074	.082
Farmers & Stockraisers	55.112	.013	.006	.001

Percentages

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
.080	.005	2.133	.047	.001	-	.001	.012
.031	.003	.531	.016	-	-	-	.002
.004	-	.210	-	-	-	-	.005
.007	-	.472	.011	.001	-	-	-
.037	.002	.920	.020	-	-	-	.004
.078	.241	1.675	.054	.022	.007	.019	.297
.045	.071	.754	.021	.011	.003	.006	.066
.027	.158	.688	.028	.010	.004	.012	.130
.005	.012	.233	.004	.001	-	.001	.101
5.304	4.599	19.836	6.877	4.739	.076	1.332	2.467
.002	.008	3.748	.075	.006	-	.474	.246
.100	.016	2.918	.041	.107	.045	.048	.196
.071	.037	1.744	.209	.041	.001	.054	.177
-	-	.127	.006	-	-	-	.001
.386	.057	7.166	.935	.699	.954	.568	1.082
-	-	.538	-	-	-	.001	.001
.355	.044	3.086	.814	.598	.625	.515	.866
.001	-	.498	.001	.001	.010	.002	.013
-	-	2.240	-	-	-	-	-
.128	.065	.187	.821	.181	.045	.828	2.842
.001	.001	-	-	.002	-	.002	-

APPENDIX TABLE V (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
Farm Managers & Foremen	.627	.041	.003	.005
Farm Labourers	36.571	.085	.036	.010
Gardeners (exc. farm)	3.203	.795	.029	.065
Gardeners (exc. farm)	1.181	.463	.011	.054
Other Agricultural Occ.	2.022	.332	.018	.011
<u>LOGGERS AND RELATED WORKERS</u>	.040	52.942	.211	.094
Forest Rangers & Cruisers	-	12.680	.150	.003
<u>FISHERMEN, TRAPPERS AND HUNTERS</u>	.005	.167	86.287	.030
Fishermen	.005	.134	81.236	.029
Trappers & Hunters	-	.033	5.050	.001
<u>MINERS, QUARRYMEN AND RELATED WORKERS</u>	.009	.096	.011	29.066
Prospectors	-	.003	-	.401
<u>CRAFTSMEN, PRODUCTION PROCESS AND RELATED WORKERS</u>	.649	16.208	1.459	31.010
MILLERS, BAKERS, BREWERS AND RELATED FOOD WORKERS	.021	.042	.562	.018
Millers of Flour & Grain	.002	-	-	-
Fruit & Veg. Canners	.003	-	.003	-

Percentage

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance Real Estate	Service	Public Admini- stration
.006	-	.001	.041	.005	.003	.009	.080
.088	.003	.007	.011	.138	.004	.047	.465
.033	.061	.179	.768	.036	.039	.770	2.297
.020	.054	.089	.360	.023	.038	.753	2.233
.013	.007	.089	.408	.013	.001	.017	.064
.391	.064	.051	.095	.046	.003	.012	.353
.011	.002	.003	.028	.001	-	.004	.331
.134	.002	.009	.003	.022	-	.005	.025
.134	.002	.009	.003	.022	-	.002	.017
-	-	-	-	-	-	.002	.008
.181	1.247	.195	.419	.042	-	.014	.134
-	.001	.001	-	.001	-	.002	.002
54.384	62.039	22.696	39.596	20.313	1.332	4.901	17.289
4.957	.003	.075	.004	1.916	.006	.110	.084
.134	-	.014	-	.021	.001	-	.001
.424	-	.002	-	.017	-	.001	-

APPENDIX TABLE V (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
TIRE BUILDERS, VULCANIZERS AND OTHER RUBBER WORKERS	-	.016	-	.018
Tire & Tube Builders	-	.002	-	.003
Vulcanizers	-	.014	-	.014
LEATHER CUTTERS, LASTERS, SEWERS AND OTHER LEATHER WORKERS (EXCEPT GLOVE AND GARMENT)	.001	.002	-	.002
Leather Cutters	-	-	-	.001
Shoemakers, Factory, nes	-	-	-	-
Shoemakers, Not in Factory	.001	-	-	-
SPINNERS, WEAVERS, KNITTERS AND RELATED WORKERS	-	.001	.014	.013
Weavers	-	-	-	.004
TAILORS, FURRIERS, UPHOLSTERERS AND RELATED WORKERS	.001	.002	-	.018
Dressmakers Not in Factory	-	-	-	.003
Upholsterers	-	-	-	-
CARPENTERS, CABINETMAKERS, SAWYERS AND RELATED WORKERS	.097	2.746	.174	1.282
Carpenters	.095	.605	.156	1.229
Sawyers	-	.324	.006	.036
Inspectors, Log & Lumber	.001	1.636	.003	.004

Percentages

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
.453	.006	.017	.001	.324	-	-	.007
.070	-	.002	-	.090	-	-	.001
.035	.006	.015	.001	.211	-	-	.006
1.403	.002	-	-	.021	-	.164	.007
.166	.001	-	-	.001	-	-	-
1.137	-	-	-	.001	-	-	-
-	-	-	-	.015	-	.159	.005
1.126	.008	.002	.001	.028	.006	.013	.002
.150	-	-	-	.003	-	.004	-
5.730	.023	.051	.004	.758	.004	.701	.079
.094	.005	.010	-	.508	.001	.628	.026
.336	.003	.032	.001	.045	-	.010	.012
4.053	13.821	.909	1.447	.700	.171	.482	1.344
.883	13.670	.859	1.408	.418	.161	.413	1.312
.925	.036	.004	.023	.074	-	-	.010
.336	.007	.004	.003	.047	-	.017	.010

APPENDIX TABLE V (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
PRINTERS, BOOKBINDERS AND RELATED WORKERS	-	.002	-	.013
Compositors & Typesetters	-	.001	-	.008
Photoengravers, Pressmen	-	-	-	.005
Pressmen, Printing	-	-	-	.004
Lithographic Occ.	-	-	-	.001
Photoengravers	-	-	-	-
Bookbinders	-	.001	-	-
Other Occ. in Bookbind.	-	-	-	-
Printing Workers, nes	-	-	-	-
FURNACEMEN, MOULDERS, BLACKSMITHS AND RELATED METAL WORKERS	.003	.180	-	.496
Heat Treaters, Etc.	-	-	-	.002
Rolling Mill Operators	-	-	-	.004
Blacksmiths, Etc.	.003	.178	-	.168
Coremakers	-	-	-	.001
JEWELLERS, WATCHMAKERS AND ENGRAVERS	-	-	-	.003
Engravers, Exc. Photoeng.	-	-	-	-
MACHINISTS, PLUMBERS, SHEET METAL WORKERS AND RELATED WORKERS	.010	1.137	.023	7.046
Toolmakers, Diemakers	-	.006	-	.011
Filers, Grinders, Etc.	-	.094	-	.056
Millwrights	.001	.147	-	.802
Fitters & A., nes, Metal	-	-	.003	.027

Percentages

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
3.151	.002	.031	.083	.064	.105	.071	.407
.994	.001	.020	.036	.029	.057	.030	.154
1.503	.001	.009	.041	.019	.039	.014	.135
1.015	.001	.007	.033	.014	.032	.009	.089
.351	-	.002	.009	.003	.005	.003	.043
.137	-	.001	-	.003	.002	.002	.003
.291	-	.001	.001	.008	.004	.018	.080
.134	-	-	.003	.005	.002	.006	.020
.230	-	.001	.001	.002	.003	.003	.017
1.772	.071	.055	.065	.034	.001	.059	.091
.085	.002	-	-	.001	.001	-	.001
.204	.003	-	.003	.002	-	-	-
.085	.033	.045	.046	.010	-	.055	.027
.044	.001	-	-	-	-	-	-
.116	.001	.002	-	.375	.002	.002	.003
.049	-	-	-	.015	-	-	.001
10.616	11.621	1.032	3.967	1.320	.026	.767	1.847
.701	.010	.006	.010	.013	-	.005	.032
.322	.015	.007	.006	.021	-	.029	.004
.653	.299	.035	.116	.028	-	.004	.026
1.148	.015	.011	.028	.047	-	.003	.031

APPENDIX TABLE V (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
Plumbers & Pipefitters	.003	.057	.006	.895
Sheet Metal Workers	-	.004	-	.114
Riveters & Rivet Heaters	-	-	-	.003
Boilermakers, Etc.	-	.013	-	.071
Welders & Flame Cutters	.001	.521	.003	3.649
Polishers & Buffers, Metal	-	-	-	.001
MECHANICS AND REPAIRMEN, ELECTRICIANS AND RELATED ELECTRICAL AND ELECTRONICS WORKERS	.042	2.990	.182	11.051
Mechanics & R., Aircraft	-	.025	-	.012
Mechanics & R., Motor Veh.	.015	.702	.017	.973
Mechanics & R., Railroad	-	.016	-	.034
Power Station Operators	-	.015	-	.120
Projectionists, Mot. Pic.	-	.003	-	-
Linemen	-	.018	-	.043
Fitters, nes	-	.001	-	.023
Fitters	-	.001	-	.018
Electrical Workers, nes	-	-	-	.006
PAINTERS, PAPERHANGERS AND GLAZIERS	.009	.062	.012	.186
BRICKLAYERS, PLASTERERS AND CONSTRUCTION WORKERS, NES	.011	.177	.017	.294
General Foremen, Constn.	.001	.065	.003	.106
Inspectors, Construction	-	.001	-	.011
Bricklayers, Etc.	.006	.005	.003	.115
Bricklayers, Etc.	.004	.004	.003	.107
Cement & Concrete Fin.	.001	.001	-	.008
Plasterers & Lathers	-	.001	-	.003

Percentages

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
.387	5.596	.092	2.283	.117	.015	.090	1.064
.442	2.114	.114	.047	.041	.001	.013	.096
.036	.047	.004	.004	.002	-	-	.003
.375	1.113	.070	.130	.026	.001	.007	.114
2.412	2.156	.339	.813	.413	.002	.534	.349
.128	.004	.002	-	.007	.001	.001	.001
6.023	7.820	11.131	24.250	11.527	.339	1.201	4.914
.342	.006	1.207	.009	.006	-	.002	.133
.441	.790	1.986	.694	7.188	.008	.128	.819
.079	.003	.669	.011	.001	-	-	.007
.086	.007	.019	3.763	.004	-	.003	.069
-	-	.005	-	.001	.001	.077	.008
.156	.342	4.530	12.293	.023	-	.005	.153
1.195	.046	.019	.225	.079	.002	.013	.011
1.009	.035	.009	.183	.059	-	.011	.005
.186	.011	.010	.041	.020	.002	.002	.007
.675	3.857	.391	.368	.574	.141	.341	.743
.453	15.174	1.298	1.588	.144	.117	.112	1.952
.056	4.002	.804	.671	.014	.004	.013	.480
.019	.060	.369	.572	.002	.094	.057	.766
.149	6.004	.027	.102	.029	.003	.015	.433
.112	4.663	.023	.036	.026	.003	.015	.199
.037	1.341	.005	.066	.003	-	.001	.234
.007	2.685	.003	.001	.003	.003	.011	.025

APPENDIX TABLE V (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
CLAY, GLASS AND STONE WORKERS	-	.002	-	.277
Lens Grinders, Etc.	-	-	-	.001
Furnacemen, Etc., C. & G.	-	-	-	.002
Stone Cutters & Dressers	-	.002	-	.258
STATIONARY ENGINE AND EXCAVATING AND LIFTING EQUIPMENT OPERATORS AND RELATED WORKERS	.061	8.279	.153	8.621
Boiler Firemen (exc. ship)	.005	.031	.003	.204
Stationary Enginemen	.009	.129	.093	.971
Motormen (veh.) Exc. Rail	-	.018	.003	1.990
Hoistmen, Etc., nes	.021	3.854	.029	4.203
Hoistmen, Etc.	-	1.725	.006	2.384
Operators, nes	.020	2.129	.023	1.820
LONGSHOREMEN AND STEVEDORES	-	.188	.009	.018
SECTIONMEN AND TRACKMEN	-	.050	-	.355
OTHER PRODUCTION PROCESS AND RELATED WORKERS	.393	.331	.313	1.298
Tobacco Preparers, Etc.	.004	.001	-	.003
Patternmakers (exc. paper)	-	-	-	.009
Paper Products Makers	.001	.003	-	.003
Photographic Proc. Occ.	-	.006	-	.013
Inspectors, Etc., nes, M.	-	.005	.003	.027
Inspectors, Etc., nes	.270	.006	.234	.002

Percentages

Manufac- turing	Construc- tion	Transpor- tation, Storage, Communi- cation	Public Utilities	Trade	Finance, Insurance, Real Estate	Service	Public Admini- stration
.906	.080	.002	.009	.145	-	.011	.013
.091	-	-	-	.076	-	.008	.003
.081	.021	-	-	.002	-	-	-
.048	.024	.001	.007	.006	-	.001	.004
2.740	9.071	3.497	3.290	.487	.314	.527	3.776
.130	.049	.063	.268	.014	.031	.079	.386
.796	.114	.216	1.405	.082	.275	.410	1.445
.009	.008	.007	.013	.004	-	.001	.007
.964	7.583	2.022	1.110	.201	.005	.016	1.289
.755	.788	.590	.248	.109	.001	.007	.096
.209	6.796	1.432	.862	.091	.003	.008	1.193
.064	.007	1.113	.003	.022	-	.004	.013
.018	.017	2.272	.036	.003	-	.001	.017
10.128	.454	.817	4.481	1.871	.100	.336	1.991
.281	-	-	-	.010	-	-	.001
.109	.003	.010	.004	.002	-	.001	.002
.844	-	.001	-	.023	-	.001	.001
.083	.004	.012	.030	.017	.015	.152	.048
.929	.011	.184	.251	.028	.036	.012	.230
.051	-	.063	.014	.070	.002	.003	.421

APPENDIX TABLE V (Cont'd)

	Agriculture	Forestry	Fishing and Trapping	Mining, Quarrying, Oilwells
<u>LABOURERS (INCL. WAREHOUSEMEN AND FREIGHT HANDLERS, N.E.S.)</u>	.478	7.288	1.164	2.471
Labourers	.455	6.178	1.127	2.214
Warehousemen, n.e.s.	.023	1.110	.037	.257
<u>ALL OCCUPATIONS</u>	100.000	100.000	100.000	100.000

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